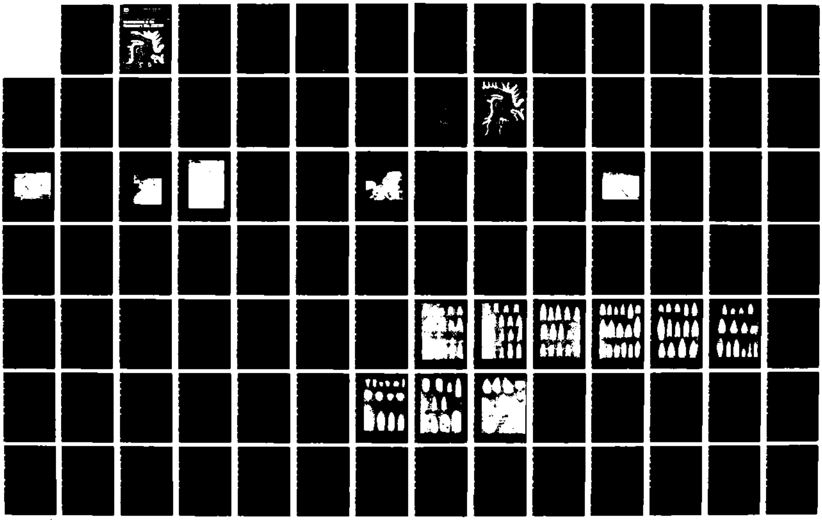
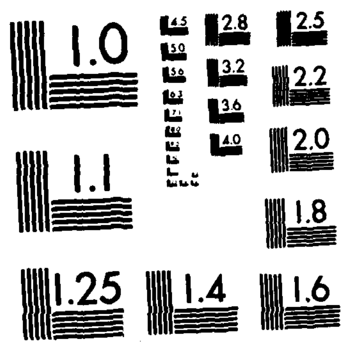
AD-A148 565 DOWNSTREAM STOCKTON STUDY; INVESTIGATIONS AT THE MONTGOMERY SITE 23CE261(U) MISSOURI UNIV-COLUMBIA AMERICAN ARCHAEOLOGY DIV C D COLLINS ET AL. 1983 1/2

UNCLASSIFIED DACW41-77-M-0241 F/G 5/6 NL





MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

US Army Corps of Engineers
Kansas City District

Downstream Stockton Study
American Archaeology Division
Department of Anthrepology
University of Missouri - Columbia

(12)

Investigations at the Montgomery Site, 23CE261

By Charles D. Collins
Andris A. Danielsons
James A. Donohue

DACW41-77-M-0241

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO. AD-A148 565	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) Downstream Stockton Study; Investigations at the Montgomery Site, 23CE261		5. TYPE OF REPORT & PERIOD COVERED Final 1977-1981
		6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) Charles D. Collins Andris A. Danielsons James A. Donohue		8. CONTRACT OR GRANT NUMBER(s) DACW41-77-M-0241
9. PERFORMING ORGANIZATION NAME AND ADDRESS American Archaeology Division Department of Anthropology University of Missouri-Columbia, Missouri		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS US Army Corps of Engineers, Kansas City District 700 Federal Building, 601 East 12th Street Kansas City, Missouri 64106		12. REPORT DATE 1983
		13. NUMBER OF PAGES 106
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		15. SECURITY CLASS. (of this report) Unclassified
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release; unlimited distribution

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Montgomery Site (23CE261)	Dalton/Early Archaic
survey/testing	Burlington Formation Chert
archaeology	
Sac River	
Western Prairie Region	

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The Montgomery Site (23CE261) was tested in November 1976 and is located on a meander loop of the Sac River in the Western Prairie Region of Missouri.

Collections from the site include over 100 projectile points ascribed to a Dalton or Early Archaic occupation. Burlington Formation chert seems to have been preferred in their manufacture.

The site is interpreted as a series of small discrete units. Excavations have established the significance of the site as an important component for study.

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

INSTRUCTIONS FOR PREPARATION OF REPORT DOCUMENTATION PAGE

RESPONSIBILITY. The controlling DoD office will be responsible for completion of the Report Documentation Page, DD Form 1473, in all technical reports prepared by or for DoD organizations.

CLASSIFICATION. Since this Report Documentation Page, DD Form 1473, is used in preparing announcements, bibliographies, and data banks, it should be unclassified if possible. If a classification is required, identify the classified items on the page by the appropriate symbol.

COMPLETION GUIDE

General. Make Blocks 1, 4, 5, 6, 7, 11, 13, 15, and 16 agree with the corresponding information on the report cover. Leave Blocks 2 and 3 blank.

Block 1. Report Number. Enter the unique alphanumeric report number shown on the cover.

Block 2. Government Accession No. Leave Blank. This space is for use by the Defense Documentation Center.

Block 3. Recipient's Catalog Number. Leave blank. This space is for the use of the report recipient to assist in future retrieval of the document.

Block 4. Title and Subtitle. Enter the title in all capital letters exactly as it appears on the publication. Titles should be unclassified whenever possible. Write out the English equivalent for Greek letters and mathematical symbols in the title *(see "Abstracting Scientific and Technical Reports of Defense-sponsored RDT/E," AD-667 000)*. If the report has a subtitle, this subtitle should follow the main title, be separated by a comma or semicolon if appropriate, and be initially capitalized. If a publication has a title in a foreign language, translate the title into English and follow the English translation with the title in the original language. Make every effort to simplify the title before publication.

Block 5. Type of Report and Period Covered. Indicate here whether report is interim, final, etc., and, if applicable, inclusive dates of period covered, such as the life of a contract covered in a final contractor report.

Block 6. Performing Organization Report Number. Only numbers other than the official report number shown in Block 1, such as series numbers for in-house reports or a contractor/grantee number assigned by him, will be placed in this space. If no such numbers are used, leave this space blank.

Block 7. Author*(s)*. Include corresponding information from the report cover. Give the name*(s)* of the author*(s)* in conventional order *(for example, John R. Doe or, if author prefers, J. Robert Doe)*. In addition, list the affiliation of an author if it differs from that of the performing organization.

Block 8. Contract or Grant Number*(s)*. For a contractor or grantee report, enter the complete contract or grant number*(s)* under which the work reported was accomplished. Leave blank in in-house reports.

Block 9. Performing Organization Name and Address. For in-house reports enter the name and address, including office symbol, of the performing activity. For contractor or grantee reports enter the name and address of the contractor or grantee who prepared the report and identify the appropriate corporate division, school, laboratory, etc., of the author. List city, state, and ZIP Code.

Block 10. Program Element, Project, Task Area, and Work Unit Numbers. Enter here the number code from the applicable Department of Defense form, such as the DD Form 1498, "Research and Technology Work Unit Summary" or the DD Form 1634. "Research and Development Planning Summary," which identifies the program element, project, task area, and work unit or equivalent under which the work was authorized.

Block 11. Controlling Office Name and Address. Enter the full, official name and address, including office symbol, of the controlling office. *(Equates to funding/sponsoring agency. For definition see DoD Directive 5200.20, "Distribution Statements on Technical Documents.")*

Block 12. Report Date. Enter here the day, month, and year or month and year as shown on the cover.

Block 13. Number of Pages. Enter the total number of pages.

Block 14. Monitoring Agency Name and Address *(if different from Controlling Office)*. For use when the controlling or funding office does not directly administer a project, contract, or grant, but delegates the administrative responsibility to another organization.

Blocks 15 & 15a. Security Classification of the Report: Declassification/Downgrading Schedule of the Report. Enter in 15 the highest classification of the report. If appropriate, enter in 15a the declassification/downgrading schedule of the report, using the abbreviations for declassification/downgrading schedules listed in paragraph 4-207 of DoD 5200.1-R.

Block 16. Distribution Statement of the Report. Insert here the applicable distribution statement of the report from DoD Directive 5200.20, "Distribution Statements on Technical Documents."

Block 17. Distribution Statement *(of the abstract entered in Block 20, if different from the distribution statement of the report)*. Insert here the applicable distribution statement of the abstract from DoD Directive 5200.20, "Distribution Statements on Technical Documents."

Block 18. Supplementary Notes. Enter information not included elsewhere but useful, such as: Prepared in cooperation with . . . Translation of *(or by)* . . . Presented at conference of . . . To be published in . . .

Block 19. Key Words. Select terms or short phrases that identify the principal subjects covered in the report, and are sufficiently specific and precise to be used as index entries for cataloging, conforming to standard terminology. The DoD "Thesaurus of Engineering and Scientific Terms" *(TEST)*, AD-672 000, can be helpful.

Block 20. Abstract. The abstract should be a brief *(not to exceed 200 words)* factual summary of the most significant information contained in the report. If possible, the abstract of a classified report should be unclassified and the abstract to an unclassified report should consist of publicly- releasable information. If the report contains a significant bibliography or literature survey, mention it here. For information on preparing abstracts see "Abstracting Scientific and Technical Reports of Defense-Sponsored RDT&E," AD-667 000.

☆U.S. GOVERNMENT PRINTING OFFICE 1982—564-036/0132

THE DOWNSTREAM STOCKTON STUDY

INVESTIGATIONS AT THE MONTGOMERY SITE, 23CE261

by

Charles D. Collins
Andris A. Danielsons
James A. Donohue

A PROJECT CONDUCTED FOR THE
UNITED STATES GOVERNMENT
U. S. ARMY CORPS OF ENGINEERS

Under Purchase Order No. DACW41-77-M-0241

AMERICAN ARCHAEOLOGY DIVISION
DEPARTMENT OF ANTHROPOLOGY
UNIVERSITY OF MISSOURI-COLUMBIA

1983

A-1

The Corps of Engineers contracted with the University of Missouri-Columbia for this Downstream Stockton Study. The University designated a study team to make the investigation and the study team has drawn conclusions regarding the effects of power generation on the Sac River downstream of Stockton Dam.

Since the Corps does not desire to interfere with the professional independence of the study team, those conclusions remain in the study. However, it should be noted that the Corps does not necessarily agree with the conclusions of the study team regarding the effects of power generation.

FOREWORD

Early in June 1976, two rather excited young men showed me a projectile point collected from the bank of the Sac River. The two were Jim Donohue and Andy Danielsons, who had just spent two days in a canoe on the Downstream Stockton segment of the Sac River, checking river banks for evidence of buried sites, as part of a survey of the cultural resources downstream from Stockton Dam. The point was obviously a Dalton Point, and it was reported that flakes were eroding from the bank just above the point, nearly 3.0 meters below the surface. Several days later, the three of us visited the locale and observed several areas where flakes were eroding from the bank. It was clear that we were observing a buried archeological site that was being rapidly eroded by bank slumpage, accelerated by power releases through the dam.

It was of obvious advantage to be sure that cultural debris was really in place prior to submitting the survey report. Accordingly, Donohue and Danielsons, accompanied by Michael V. Miller, soils geomorphology graduate student at the University of Illinois, excavated a profile in the bank. Two notable results were forthcoming: (1) it was determined that cultural debris was indeed in place, and (2) contact was established with Charles D. Collins – an amateur archeologist who had been regularly monitoring the site for over five years, and had a rather extensive (and very impressive) collection of points from the site. The joint evidence of the University of Missouri survey and the Collins collection was a convincing demonstration of the importance of the site.

Donohue and I therefore met with Collins in Springfield in April 1977. It was obvious that each group had data of a kind that the other did not: Collins had a large and impressive collection complete with provenience data; the University of Missouri had soil profile descriptions, a radiocarbon date in process, and other testing data needed to help put the collection in context. It was mutually agreed that a joint report would convey far more information than single statements by either of us. Donohue and Collins, assisted by Danielsons, each undertook the writing up of their data. I have woven the two manuscripts into a logical order here, to present an integrated report on all archeological investigations at the Montgomery Site.

I should therefore emphasize that the following report goes beyond that required by the Corps of Engineers in fulfillment of the purchase order. We believe, however, that only a report of this nature can adequately describe to the Corps of Engineers and the people of Missouri the unique and immense potential of this site to inform us concerning some of the earliest inhabitants of the state. Its production in this form is a tribute to the enthusiasm of Collins, Donohue and Danielsons for the archeology of the site.

Columbia, Missouri

Donna C. Roper
Project Director

ACKNOWLEDGEMENTS

It is always difficult to express one's appreciation to all of the individuals who have given their help, encouragement, and expertise during an excavation and report preparation. My attempt in expressing my appreciation follows.

I would first like to thank Clark I. Montgomery and his family for their enthusiastic support of and cooperation with the investigations conducted on their property. Their help in making this report possible is gratefully acknowledged. Dr. Donna C. Roper, the principal investigator, not only labored throughout the period of excavations, but also edited and combined the manuscripts of Mr. Charles Collins, Andris Danielsons and myself. Her comments and criticisms are appreciated and made this report, in its present form, possible. Dr. W. Raymond Wood not only gave his comments on the collections and the site itself, but also completed the final editing of this paper. His time, insights, and expertise are greatly appreciated.

A special note of thanks is offered Dr. Donald L. Johnson, not only for his expert descriptions and analyses of the soils, but for his advice and enthusiasm, which were a constant source of encouragement. Dr. C. Vance Haynes not only identified the sediments at the site, but also arranged for dating the radiocarbon sample. His assistance is greatly appreciated. During the course of the excavations and analyses several other individuals were consulted on their various specialties. I thank Michael V. Miller for his soils description, Alf Sjöberg for his phosphate analysis, and David J. Ives for his trace element analysis of the chert flakes (which, unfortunately, was destroyed in computer storage). Jean Sparks is thanked for her labor in typing this manuscript, and Rebecca Ketchersides' darkroom work provided the photographic documentation.

The excavations at the Montgomery Site were particularly difficult, due not only to wet and muddy conditions, but because of the time of year these tests were conducted — which proved to be the coldest November in Missouri's recorded history. I particularly thank the hard working, long suffering crew who labored through these conditions — Andris Danielsons, Edward Fulda, Margaret D. Mandeville and Christopher Young. Additionally, Mrs. Jean Moodie of Huntsville, Missouri generously donated several days of her time to help with the excavations. I also thank Jesse Kaufman and Harold Musselman for their excellent backhoe work at the site.

We are also indebted to the Corps of Engineers, who not only recognized the need for prompt testing of the Montgomery Site and expedited the processing of the purchase order, but who coordinated with the Springfield Power Authority to hold power releases to a minimum during the period of testing. We also thank the staff of the Stockton Dam and the Springfield Power Authority for their cooperation in trying to keep us as dry as possible under the circumstances.

Finally, I express my very special thanks to Rolland E. Pangborn, who not only participated in all phases of the test excavations, but who freely gave the author the benefit of his vast experience with and insights into Missouri prehistory. His efforts in teaching me how to keep my eyes open will never be forgotten.

JAD

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF FIGURES: Continued

LIST OF TABLES

THE DOWNSTREAM STOCKTON STUDY

INVESTIGATIONS AT THE MONTGOMERY SITE, 23CE261

by

Charles D. Collins
Andris A. Danielsons
James A. Donohue

ABSTRACT

The Montgomery Site (23CE261) was located in June 1976 during a survey to assess the effects of power releases through Stockton Dam on the downstream environment. It had been known and regularly monitored by amateur archeologists since before the impact of Stockton Dam, however. The site is on a meander loop of the Sac River in the Western Prairie Region of Missouri.

Testing was performed in November 1976. Six excavation units were excavated – four along the bank, and two in the terrace. The cultural levels are within a Holocene age river terrace; a radiocarbon date of 9800 B.P. is from near the base of the terrace, although it predates the cultural deposits.

The collections from both reconnaissance of the river banks and the excavations include over 100 projectile points ascribed to a Dalton or Early Archaic occupation, plus a variety of other chipped stone tools and debitage. Burlington Formation chert seems to have been preferred for their manufacture.

Examination of the distribution of such tools as were collected *in situ* suggests a thin occupation layer

about 3.0 m below the ground surface. At least one activity area was defined.

The site is interpreted as a series of small discrete units occupied during the Dalton and Early Archaic periods. The excavations have established the significance of the site as an important component for study of these periods in Missouri.

INTRODUCTION

by

James A. Donohue

The Montgomery Site, 23CE261, was located during the Downstream Stockton Survey, a survey conducted to assess the effects of power releases from the Stockton Dam on archeological resources in the Sac River basin of southwest Missouri (Roper 1977). During the survey, a canoe trip was made to inspect the river banks for buried sites. Site 23CE261 was located when the surveyors noticed flakes eroding out of a steep cutbank below the water mark representing maximum power releases.

Close inspection of the site revealed flakes embedded some 3.0 meters below the surface. A classic Dalton Point, retaining part of its soil matrix, was recovered from the water at the edge of the bank; it was inferred that the point was related to the materials in the face of the bank.

The survey data suggested that an early "Hunter-Forager" component (Chapman 1975) was rapidly being destroyed by erosion from water released through the Stockton Dam. A profile was therefore cut at the site in August 1976. This 1 by 1.5 meter test was conducted to determine if cultural materials remained in situ, and to provide a profile for soil description. This test yielded a dense concentration of lithic debris but no diagnostic artifacts. The debitage was interpreted as being in situ and of probable Dalton Period age (Donohue et al. 1977). Based on the results of this test and the survey data, Roper (1977: 102) recommended (1) nomination to the National Register of Historic Places, (2) immediate test excavation to determine the horizontal extent of the site, and (3) if warranted, intensive excavation at the site.

Following Roper's recommendation, test excavations were conducted between 8 November and 5 December 1976. These tests were undertaken by the University of Missouri-Columbia, American Archaeology Division for the U. S. Army Corps of Engineers under the terms of Purchase Order DACW41-77-M-0241. The excavations were supervised by the author under the direction of principal investigator Dr. Donna C. Roper.

The purposes of the test excavation, as specified in the Scope of Work, were to determine "(1) physical parameters of the site; and (2) the total extent and potential extent of damage caused from the power releases of Stockton powerhouse." Additionally, the overall goals and research strategy of the Harry S. Truman Dam and Reservoir Project were considered. This research design has already been presented in detail (Roper 1975, 1976; Roper and Wood 1975) and will not be discussed at length here. It was, however, hoped that data from the Montgomery Site would bear on four research objectives of the Truman Reservoir Project; (1) to define the nature of the Dalton occupation, (2) to provide data to fill some of the temporal gaps represented in the Rodgers Shelter sequence, particularly

Culture/Time Stratigraphic Unit 10 (McMillan 1976: 213), (3) to recover evidence bearing on the nature and extent of contacts between peoples of the Plains and the Ozark Highland in pre-Altithermal times, and (4) to evaluate the significance of these early cultural remains as they relate to other drainages in southwestern Missouri.

In August 1976, contact was established with Charles D. Collins of Springfield, Missouri who had been systematically collecting the locality for the past five years. During this time, he had collected over 80 diagnostic points and numerous other tools referable to pre-Altithermal times. The account of the Montgomery Site (which has also been referred to as the Harkins Site and the Cutbank Site) contained within this report is therefore a result of the collaboration between the University of Missouri and Collins in presenting the archeology of the site as it is currently understood.

ENVIRONMENTAL SETTING

by

James A. Donohue

The Montgomery Site is in Cedar County, southwestern Missouri. The portion of Cedar County with which we are concerned lies in the general physiographic region of the Springfield Plain. Immediately to the east is the Salem Plateau, or Ozark Highland. To the west lies the Cherokee Lowland, although this western boundary is indistinct, both archeologically and geographically (Chapman 1975: 6). The area in which the site is found is included in Chapman's (1975) archeological-physiographic Western Prairie Region.

The Sac River, along which the site is located, flows generally north, close to the eastern edge of the Springfield Plain (Fig. 1). The topography is characterized by gently rolling hills with moderate relief. The valley floor ranges in width from .4 to 2 kilometers. The river bluffs rise as much as 15 meters above the valley floor. The dominant geologic formation within the valley in the vicinity of the site is the Quaternary alluvium (Baker 1962) on which a soil once classified as Osage Silty Clay Loam (Watson and Williams 1911) was formed.

The site itself is on the west side of a semi-circular meander loop of the river. The floodplain on this side of the river extends .5 kilometer to the west, where it ends abruptly at the base of Gravely Bluff, a relatively steep, 15 meter high bluff (Fig. 2). At least one spring flows from the base of this bluff (R. E. Pangborn, personal communication, 1976).

The site therefore lies in the ecotone between the oak-hickory climax forest to the east and the prairies to the west, although the border is diffuse. Expectably, the distribution of the different types of vegetation has left its imprint on the underlying soils. The Montgomery Site is located within the Bolivar-Mandeville soil group, a group which developed under natural forest vegetation. Immediately to the east and west of the site are the Gerald-Craig-Eldon and Newtonia-Baxter soil groups, developed under prairie and prairie-forest transition vegetation (Scrivner, Baker, and Miller 1966).

The potential exploitable resources in the Sac River Basin are many and varied. These have already been described by Roper (1977) and are not discussed here. Suffice it to say that besides the many potential biotic

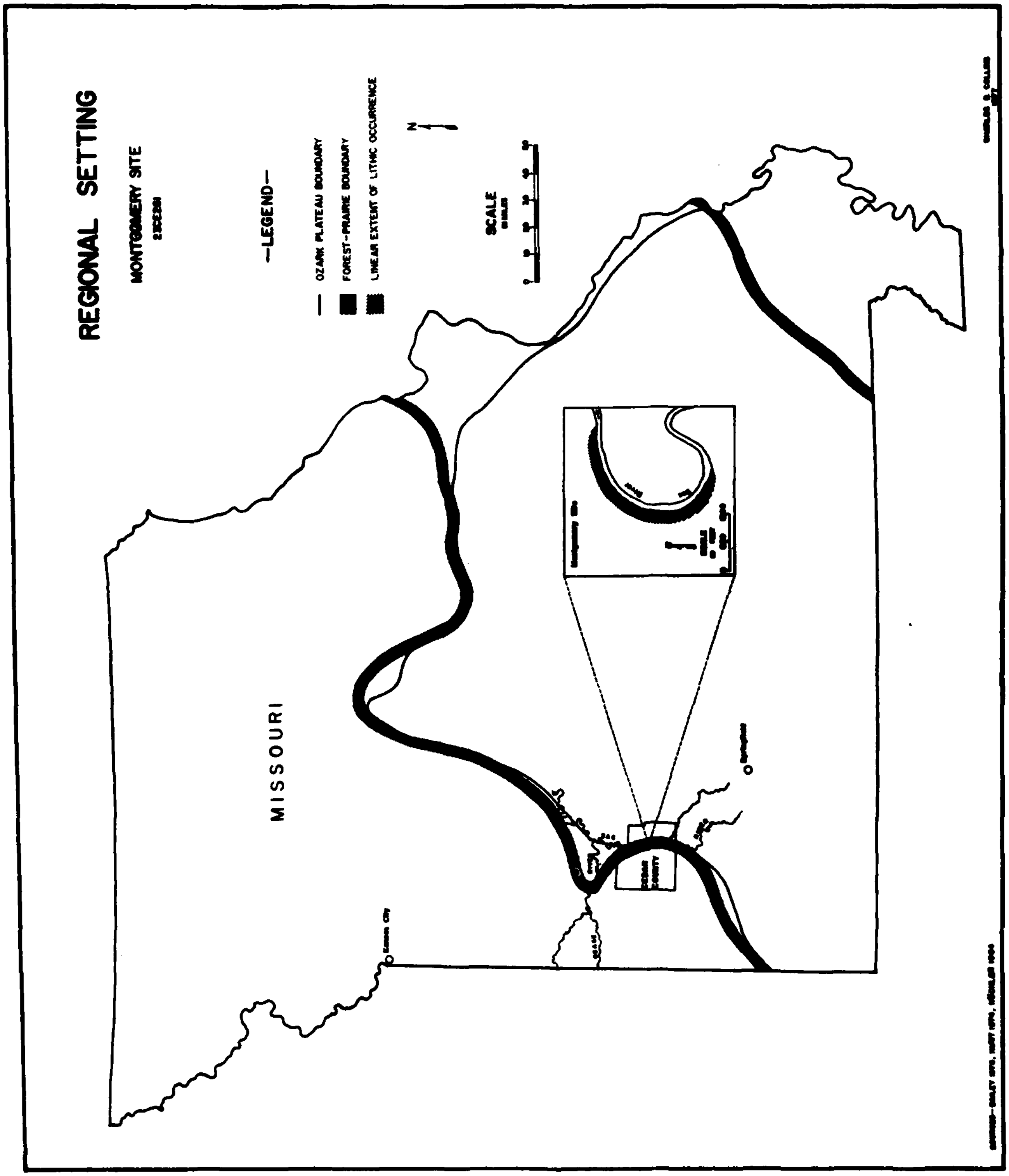


Figure 1. Regional setting of the Montgomery Site.

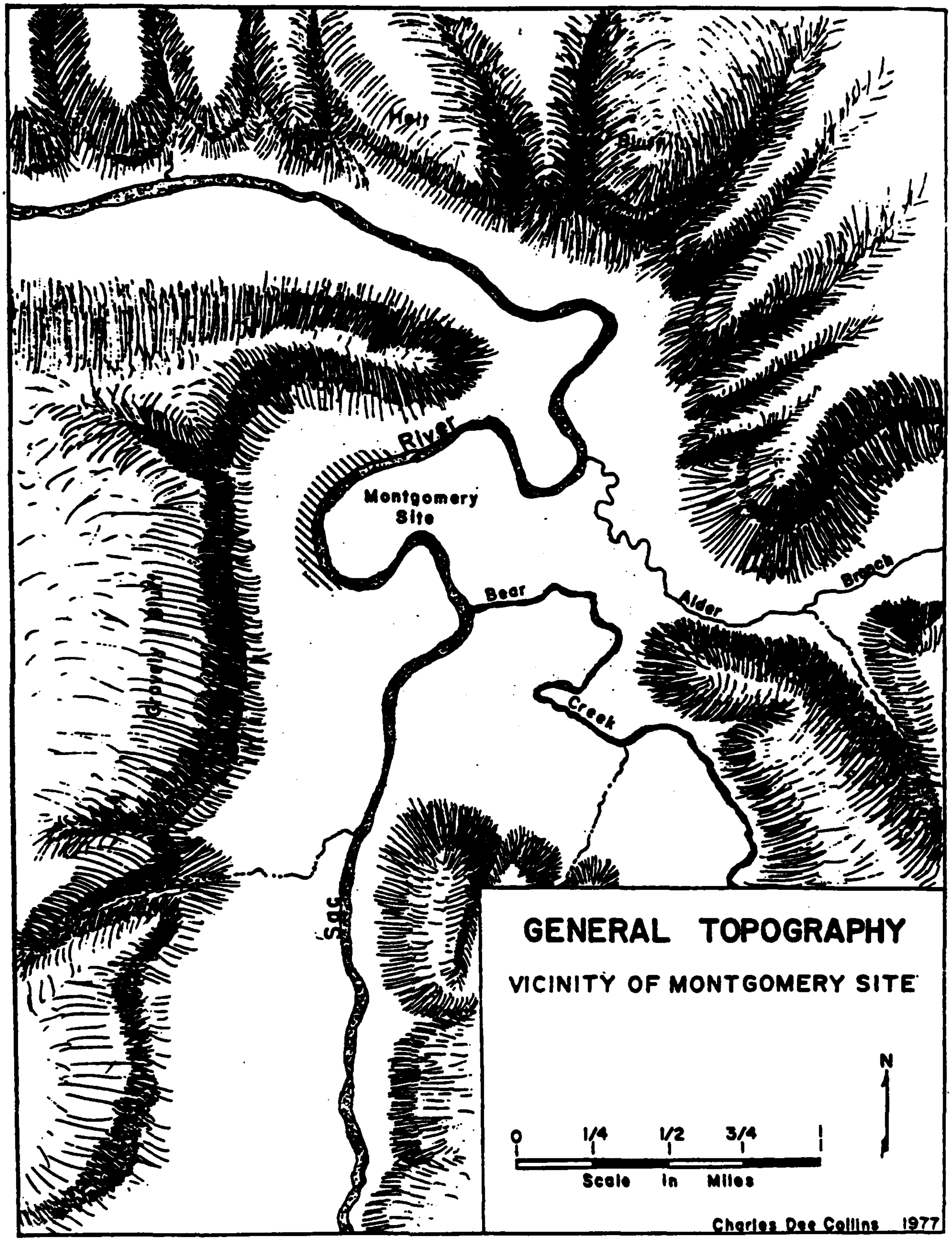


Figure 2. General topography, vicinity of the Montgomery Site.

resources in the Sac River basin, there are also varied chert resources from the Jefferson City, Burlington, and Chouteau formations. Much of this chert is of high quality and is easily obtainable from river gravels. In addition to ample supplies of easily flaked chert, the Warner formation sandstone outcrops along Gravely Bluff, just west of the site (Baker 1962).

There is no direct evidence for the early Holocene environment of the Sac River basin. One may assume, however, that this environment did not differ significantly from that near Rodgers Shelter in the Pomme de Terre River Valley to the east. Even at this paleo-environmentally relatively well documented site, however, there are few data for the period directly following the disappearance of the Ozark spruce forest, about 12,000 years ago. Some indication of what the paleo-environment at the Montgomery Site might have been has been inferred from macro-floral remains recovered from the Dalton levels at Rodgers Shelter. These data suggest that an oak-hickory forest had developed in that area by 10,500 years ago (McMillan and Wood 1976: 237).

HISTORY OF INVESTIGATIONS

by

Charles D. Collins

Archeological investigation at the Montgomery Site is a relatively recent activity. Prior to 1972, the locality held little interest to local collectors since other sites yielded more artifacts. An occasional find by individuals hunting or fishing along the Sac River was the only evidence that the location was utilized prehistorically. However, the number of artifacts removed from the site and the identity of individuals that now possess this material are unknown.

The earliest known find in the locality now called the Montgomery Site occurred in the late 1930's when the late Mr. Finis Baumgarner, my uncle, removed a large point from the bank. The exact provenience of this artifact was not noted, except that it was protruding from the bank and could not be removed until soil was excavated around it. This artifact is now in the possession of my father, Mr. Clarence Collins.

In early 1972, my father and I visited the location. Power generation at the newly-constructed Stockton Lake had begun a short time before our visit, but the impact of this activity on the channel banks downstream had been underestimated. In a sense, power generation had rejuvenated several miles of the Sac River below the dam, accelerating erosional processes by adding an above-normal flow in the stream channel. Erosion of the channel was especially severe along meanders. Rapid cutting on the outside of the meander loop was paralleled by rapid silting and deposition on the inside of the channel loop. During periods of peak-capacity generation, the stream channel was filled to the point of overflowing into lower levels of the floodplain.

Erosion at the Montgomery Site was especially noteworthy. Perhaps the great length of bank exposure at the locality promoted more rapid erosion than would have occurred at a location smaller in size and partially protected by vegetation. Two large trees which had been eroded out upstream were lodged against the exposure.

Other debris on the surface of the bank included drift, a corner fence post with the concrete still attached, and barbed wire from a fence. Slumpage was occurring throughout the length of the bank, as evidenced by seven large slump blocks and additional bank-cavings. Although the site had been visited on several occasions during the period prior to electricity generation at the Stockton facility, slumpage had never been noted. This may be explained by the fact that natural flooding was infrequent and of short duration. Once power generation began, however, it occurred on a regular basis during the week, but not on weekends. High water over five-day periods promoted total soil saturation along the exposure. Soil saturation plus undercutting into the bank produced the slumpage. The material released from the bank was carried downstream as power generation was resumed.

It became apparent at the time of our 1972 visit, therefore, that the stream was cutting into an occupation level far more extensive than had been suspected in the past. Several concentrations of waste flakes were found embedded both in the bank and in slumps. Two complete Dalton points and two basal fragments were also found, all associated with slumpage. The amount of cultural material lost into the river channel will never be known because the strong current during the weekly power production could easily remove an artifact either from the bank or associated slump, and carry it into the channel to be mixed with the gravel.

The main technique employed in studying the Montgomery Site was a controlled surface survey. Extensive time and funding would have been required to adequately excavate a site of its size and depth. Also, material was being removed so rapidly that immediate control on provenience was necessary. During the period of study, horizontal erosion removed 28.3 m (93 ft.) of the terrace between the datum point and the original channel wall. The method used to study the site allowed reasonably accurate measurement and recording of the horizontal and the vertical provenience of the artifacts.

A reference or datum point was established to allow close control on the provenience of the material. A point was selected along a drainage ditch which was nearly centrally located on the terrace surface. A distance of 61 m (200 ft.) from the edge of the channel was chosen to insure that erosion and slumpage would not remove the reference.

The site was visited on a weekly basis over a period of four years. When artifacts were found exposed, their positions were established by marking the terrace surface directly above the material and measuring both distance and direction from the reference point. The position was then noted and numbered on a field map, with each artifact identified by a corresponding number. The depth of an artifact determined to be *in situ* was measured by lowering a tape from a position vertical to the object. If the *in situ* position was in doubt, the artifact was considered out of context and recorded accordingly. In addition to noting the depth and distribution of artifacts, the provenience of any clustering of debitage (any waste flakes which had not been used or modified as a tool) was noted. Waste flakes which occurred randomly in the bank or loose along the channel were collected, but not recorded.

THE 1976 TEST EXCAVATIONS

by

James A. Donohue

Based on discussions with Collins, and on continued monitoring of the river bank between the conclusion of the survey and the commencement of the excavations, it became apparent that 23CE261 should not be interpreted as a single site. Instead, it must be viewed as a series of discrete occupations at different, although possibly overlapping, points both vertically and horizontally along the entire meander cutbank. Clearly, it was necessary to excavate at several widely separated locations along the cutbank in order to define the boundaries of the cultural deposits. Several excavation units were placed along the river bank according to indications of cultural debris eroding out of the cutbank (Fig. 3). Locations of two interior field excavations were based on the information obtained from the August test profile.

The timing of test excavations was designed to coincide with repairs being carried out at Stockton powerhouse, thereby avoiding the problems inherent in excavating a site undergoing daily inundation. Unfortunately, the repairs were completed early and power releases were resumed on the first day of excavation. The ensuing difficulties were partially overcome through Springfield Power Authority cooperation in reducing the length of power releases. Releases normally lasted from six to ten hours a day. The modified schedule called for three hour releases. This schedule reduced the amount of the

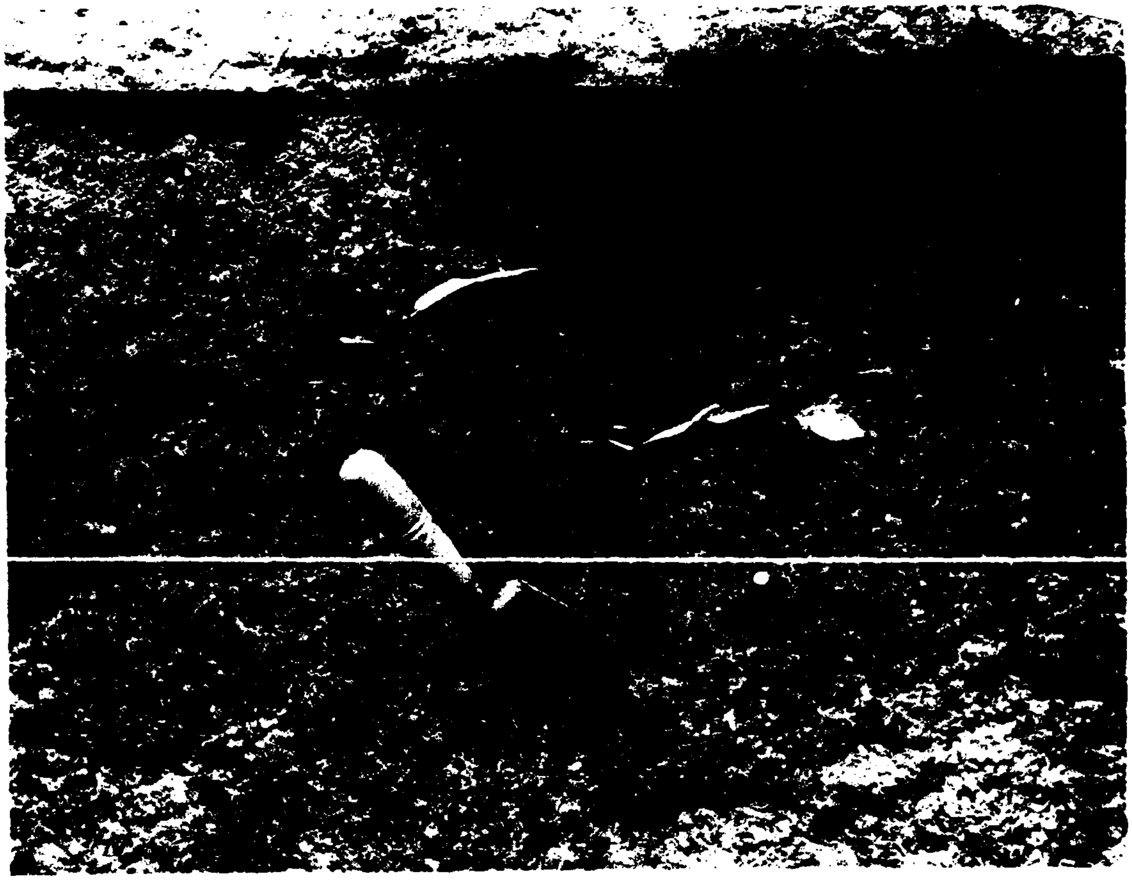


Figure 3. View of lithic debris eroding out of the cutbank, 3.3 m below the surface.

site which the river actually inundated, and the amount of time that this level was under water (Fig. 4). To further alleviate the difficulties caused by the power releases, the work week was scheduled so that Saturday and Sunday were normal work days since no power releases were made on weekends. The effect of even reduced power releases, however, precluded the possibility of excavating any test unit entirely down to the river gravels.

Field Organization

The fields on the west side of the meander are separated by a series of drainage ditches. These fields therefore were used as arbitrary units for investigation and labeled field numbers 1, 2, 3, 4, and 5 (Fig. 5).

Excavation Procedures

Vertical and horizontal data were first established, and a north-south base line laid out. All proveniences were referenced to these points.

Sterile overburden was removed by a backhoe to a depth of approximately 2.5 meters below the surface at each excavation unit. All layers containing cultural materials were excavated by hand in arbitrary 5 centimeter levels. Due to the extremely high clay content of the soil, screening of the sediments was not feasible. These levels instead were carefully trowelled or skim-shoveled. All tools and features were plotted horizontally and vertically.

Figure 4. View of the Montgomery Site looking north during a power release. Gravely Bluff is visible to the northwest. The higher water mark represents the level reached during maximum power releases while the level seen on the photograph marks the high water of the reduced schedule.

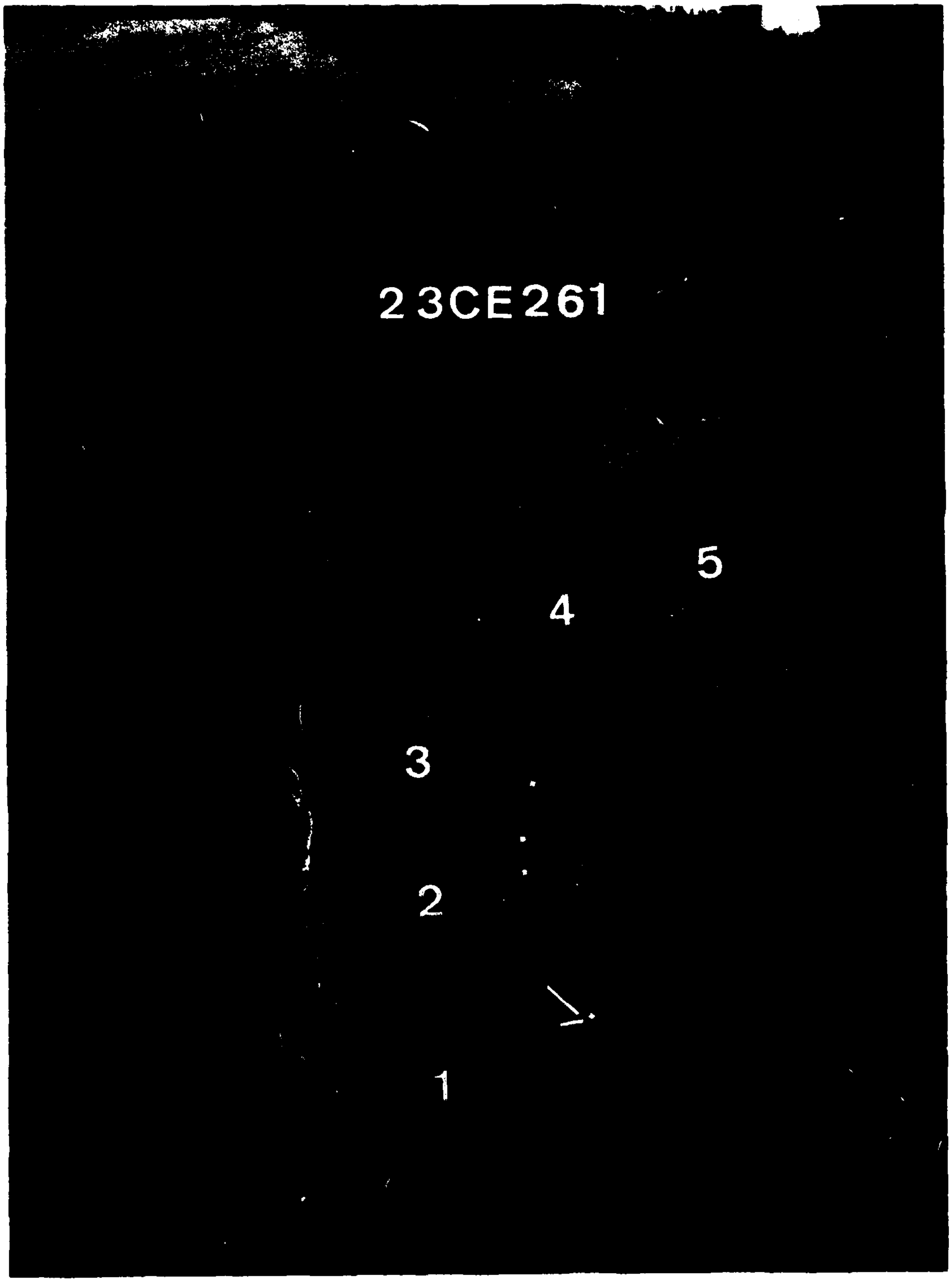


Figure 5. Aerial photograph of the Montgomery Site and vicinity showing field organization (Photograph STR-1-03, 3-3-75).

Description of Excavation Units

FIELD 1 INVESTIGATIONS

Three major and one minor excavation units were in Field 1. The first major excavation, designated BT-1 (Bank Trench - 1) consisted of a five by two meter trench laid out on either side of the August test profile, on the river bank. Squares within this trench were designated 1S through 5S and 1E through 3E. Those units designated 3E were twenty centimeters wide, and were balks left standing to help protect the excavation from inundation. They were removed at the conclusion of the investigations. Squares 3S2E and 3S3E are the location of the August 1976 test profile (see Figs. 6 and 7).

A small four meter by fifty centimeter unit was also excavated, entirely by hand, one meter north of Square 1S3E. This unit, labeled BT-1a, was designed to recover debris exposed after digging Bank Trench 1.

The second major excavation unit in Field 1 was a five by one meter trench perpendicular to the bank edge. The southwest corner of this trench was seven meters west of the northeast corner of BT-1 (Fig. 8). This excavation was conducted to determine the presence or absence of cultural materials west of the debris eroding from the bank. Squares within this unit were designated 1W through 5W. This excavation proved to be entirely sterile. Square 1W was excavated to a depth of 5.4 meters below datum (4 meters below surface), and the remaining four squares were excavated only to 4.4 meters below datum (3 meters below surface).

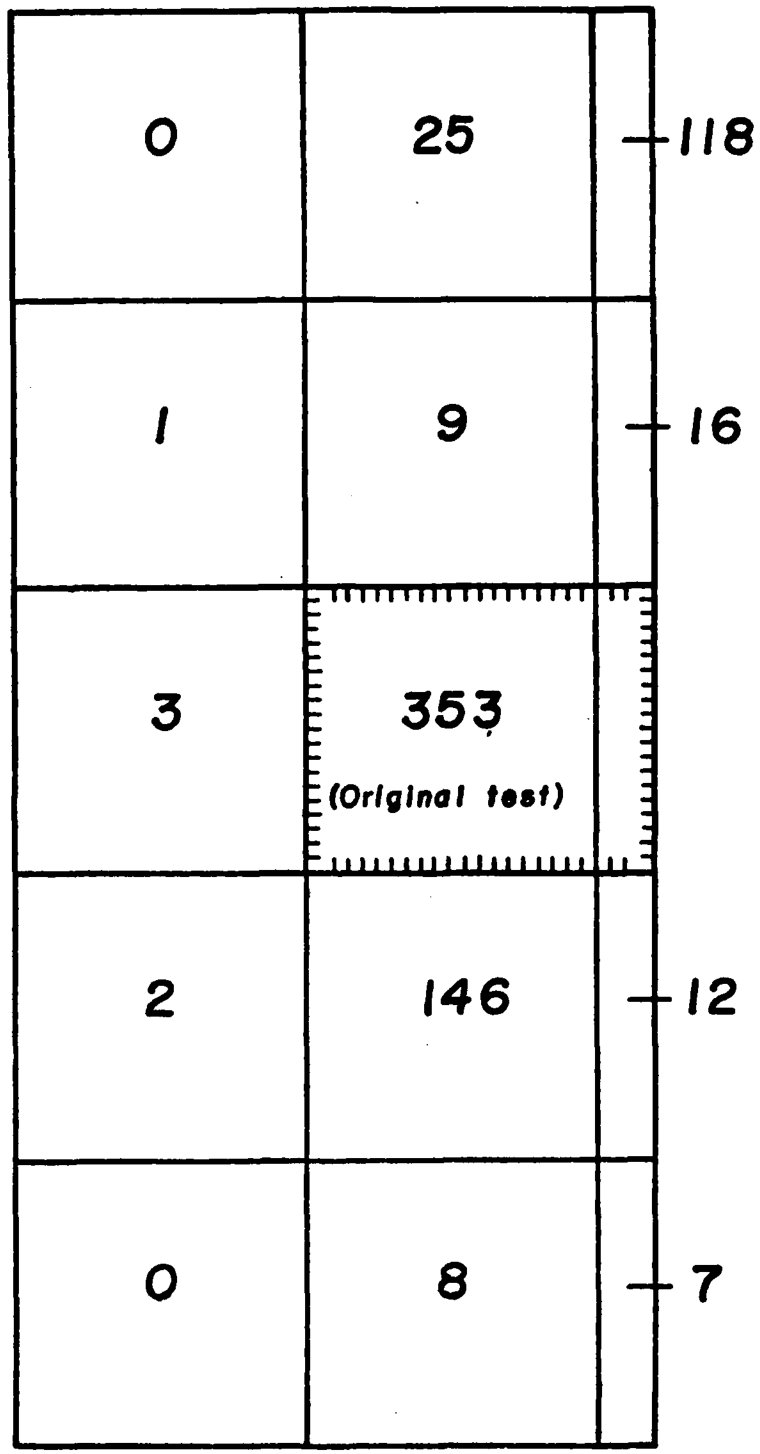


Figure 6. Excavated units in Bank Trench 1 showing the location of the August test profile and total debris counts by square (blocks are one meter square).

Figure 7. View of bank trench 1 during power release.

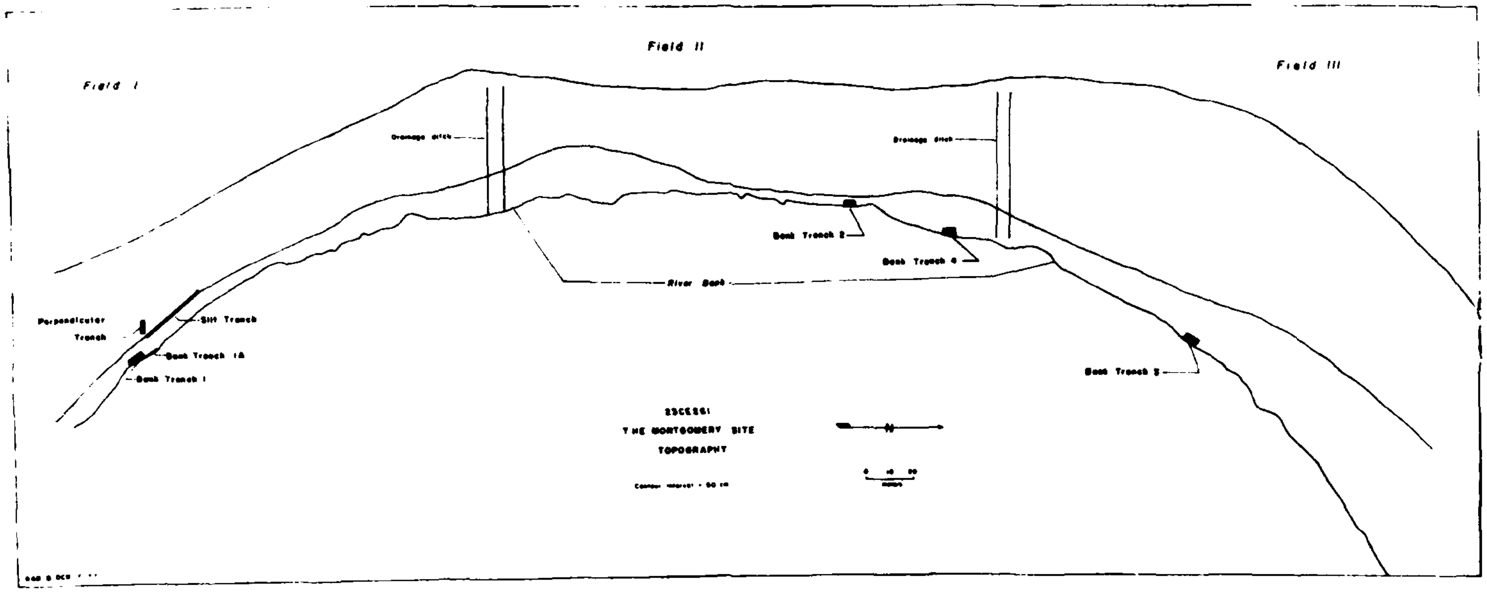


Figure 8. Contour map of the Montgomery Site showing placement of excavated units.

The third major unit excavated in Field 1 consisted of a single backhoe bucket-width slit trench, thirty meters long and approximately one half meter wide. This unit paralleled the river bank some six meters west of it. It was excavated to a depth of 4.9 meters below datum (3.5 meters below surface) at its south end, although most of the unit ranged in depth from 3.9 to 4.3 meters below datum (2.5 to 2.9 meters below surface). The purpose of this unit was to provide a long continuous soil profile, and to determine whether occupation units observed close to the bank edge were present. One well-made bifacially flaked adze-like tool was recovered from the back dirt at the extreme north end of this unit. This tool could not have been buried deeper than 3.4 meters below datum (2 meters below surface), which was the maximum depth of the excavation in this area. Shovel tests were carried out at one meter intervals within this trench. No additional cultural materials were found.

FIELD 2 INVESTIGATIONS

One unit, Bank Trench 2, was originally planned for Field 2. BT-2 was a two by three meter unit excavated to a depth of 4.7 meters below datum. The northeast 1 m square was excavated to a depth of 5.22 meters below datum (3.82 meters below surface). This excavation proved to be sterile except for one chert flake found in the backhoe back dirt.

On 24 November another concentration of flakes was discovered along the bank of Field 2. Bank Trench 4 was excavated over them. BT-4 was also a two by three meter unit excavated to a depth of 4.85 meters below datum

(3.45 meters below surface). Cultural materials were recovered from levels 4.3 to 4.8 below datum (2.9 to 3.4 meters below surface). All cultural debris consisted of debitage, except for two utilized flakes and one piece of fire-cracked cherty limestone (Fig. 9). A total of 295 pieces of lithic debris were recovered. All debris was individually plotted both horizontally and vertically. Burned earth and minute charcoal fragments were present, but the quantity of charcoal was not sufficient for radio-metric dating. A series of soil samples were collected for phosphate analysis.

FIELD 3 INVESTIGATIONS

One two by three meter bank trench was excavated in Field 3. Four artifacts were recovered from levels 3.95 to 4.7 meters below datum (2.55 to 3.3 meters below surface): one tabular core and three flakes. A few small fragments of red ochre were also recovered.

Stratigraphy

No distinct natural strata were recognized at the Montgomery Site; however, a well developed soil profile is visible along the entire cutbank and was identified in every excavated unit. This profile was first described by soils geomorphologist Michael V. Miller on the basis of the August 1976 test excavation (Donohue *et al*. 1977). A description of this profile (taken from BT-1) is presented in Fig. 10. In addition, geomorphologist C. Vance Haynes visited the Montgomery Site with Johnson and Miller on 5 December 1976 and identified the sediments

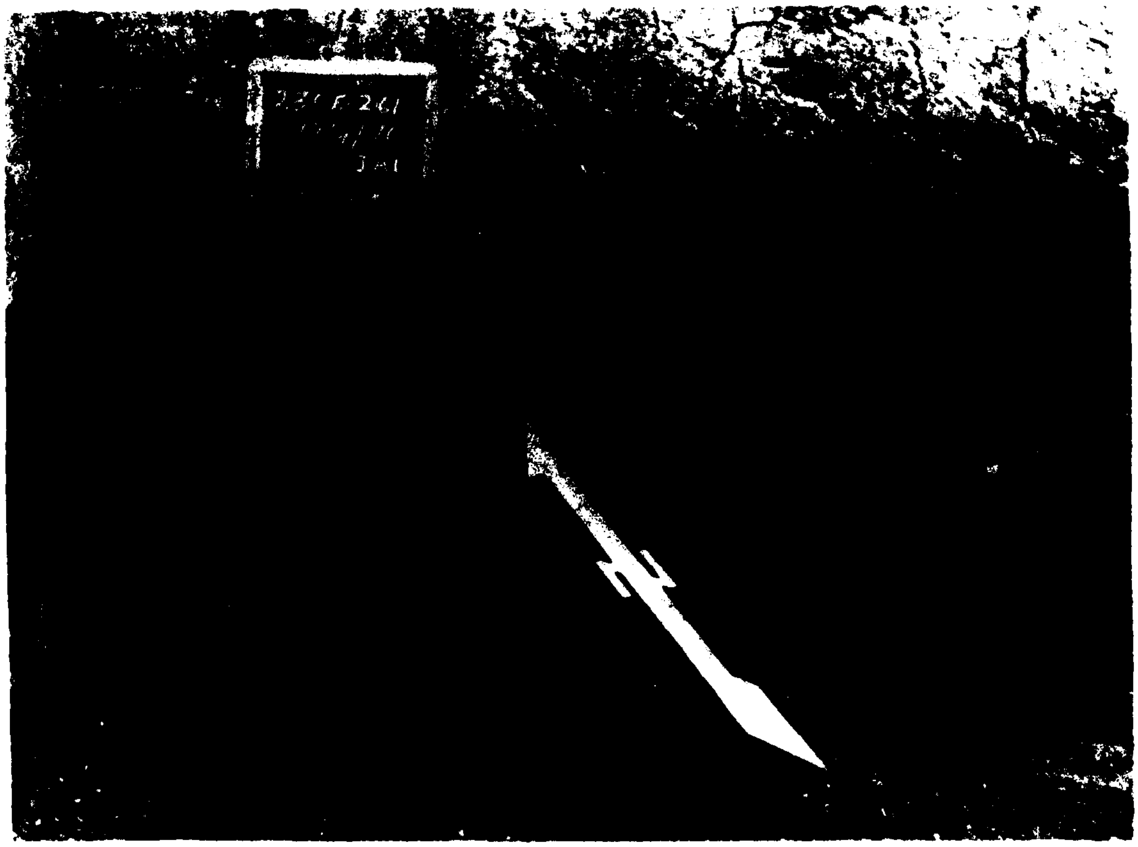


Figure 9. View of cultural materials _in_ _situ_ at the Bank Trench 4 excavation.

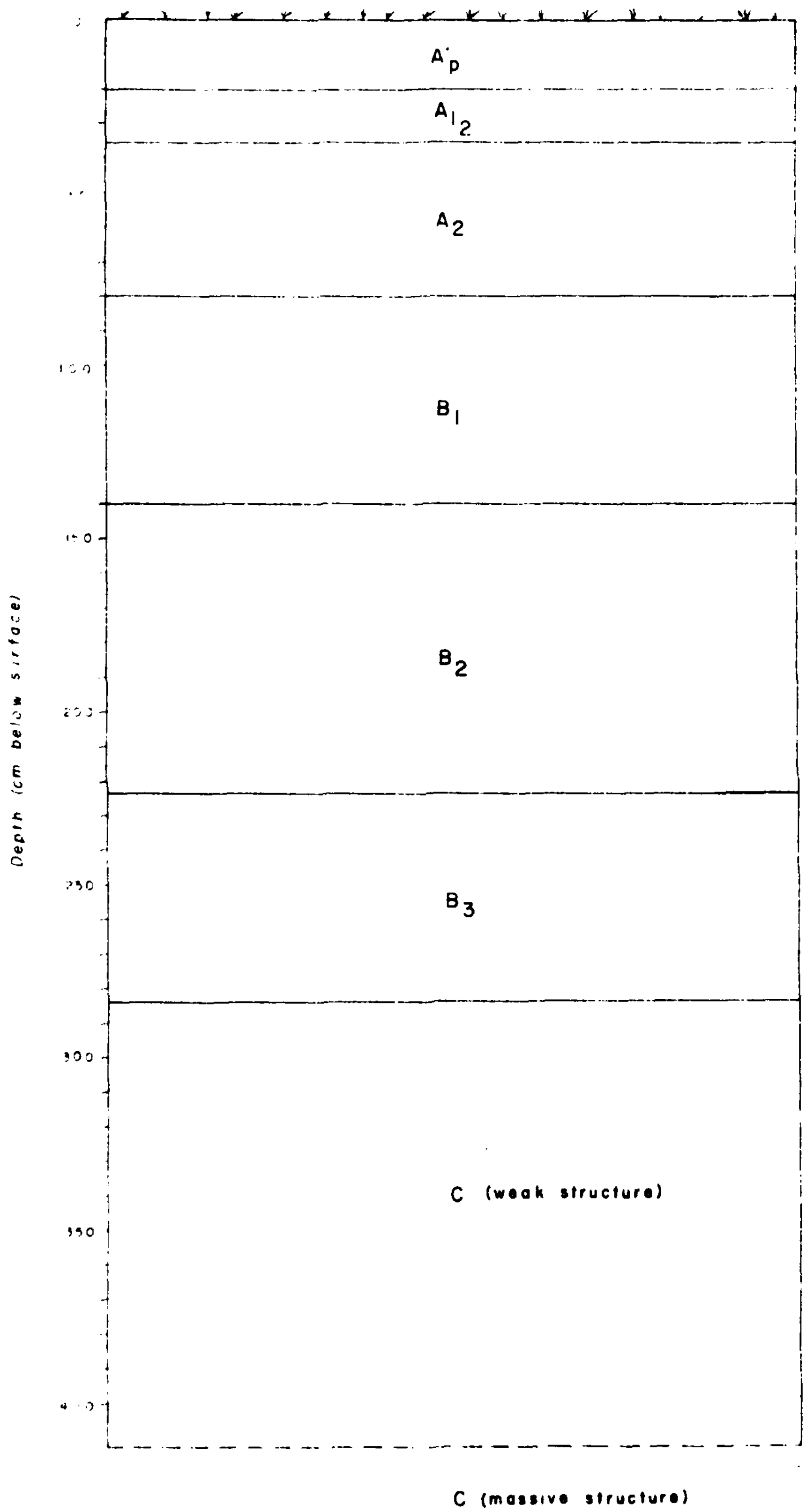


Figure 10. Soil profile, Bank Trench 1 excavation, described by Miller.

as Rodgers Alluvium (Haynes 1976, personal communication). This deposit, as defined at Rodgers Shelter in Benton County (on the Pomme de Terre River), represents a period of rapid alluvial aggradation between 11,000 and 6000 years ago (Haynes 1976). This identification is consistent with the inferred age of the cultural deposits based on their position in a deep, well developed soil profile and on projectile point typology.

Though no natural strata were identified and soil analysis revealed no evidence of a buried paleosol, the potential for a buried soil seems high. This is suggested by the extreme regularity of the depth of the cultural materials along more than a kilometer of cutbank. Cultural debris from all bank trenches occurred at approximately the same depth, suggesting a time when there was a fairly stable surface at this site during the Dalton Period. Further soil tests will be necessary to determine the presence or absence of a buried soil.

TOTAL PHOSPHATE ANALYSIS

The effects of human behavior on chemical composition of the soil have been noted by several authors. Phosphates in particular have been found to be good indicators of past human activity (Eidt and Woods 1974; Ahler 1973). A series of soil samples for total phosphate anlaysis were collected from BT-4. These were analyzed by Alf Sjöberg, Research Assistant in the American Archaeology Division, University of Missouri-Columbia. Total phosphate content was determined for a sample taken every 20 centimeters to a depth of 2.5 meters below surface, and every 10 centimeters from 2.5 to 4 meters below surface. Phosphate values compared with lithic debris density are graphically presented (Fig. 11).

The results of the test are inconclusive. The high values for the first 20 centimeters below surface are interpreted as due to modern agriculture. The bulge in phosphate content at 2.6 meters to 3.1 meters below surface may be attributable to sample contamination which occurred when the samples were collected (Sjöberg, personal communication).

Indications of disturbance begins approximately 30 centimeters above the first cultural material and remains fairly high until three meters below the surface, below which total phosphate values drop off rapidly. Since these are the levels with the highest lithic debris density, these phosphate test results are exactly contrary to expectations. Interestingly, though, this is also the depth of which the site undergoes daily inundation. The decrease in total phosphate content in levels where it should be highest may perhaps be attributed to leaching of the deposits by daily flooding by the Sac River. Leaching should not occur back from the bank and future total phosphate tests will be run from core samples.

Age of the Cultural Deposits

Most of the cultural materials are eroding from a cultural horizon 3 to 3.3 meters below the present surface. Although no diagnostic artifacts were found in the excavations, two temporally diagnostic points were located _in situ_, projecting from the cutbank at a depth of 3.1 meters below the surface. Both points are classified as Dalton, and one was located only ten meters

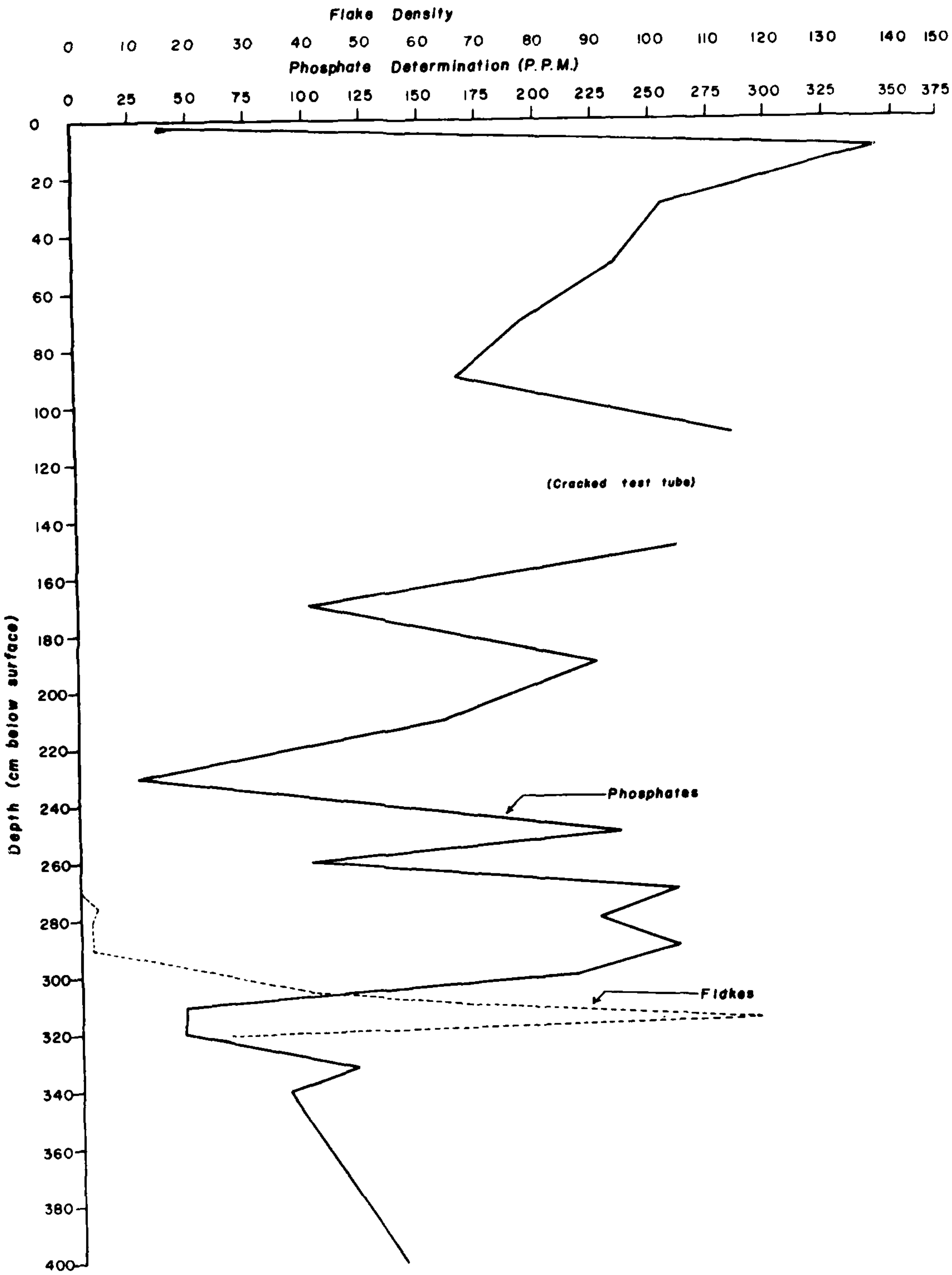


Figure 11. Total phosphate values compared with total lithic debris densities by depth from the BT-4 excavation.

from the BT-3 excavation. The location of these points in situ definitely ties these levels to the Dalton period age. The Dalton period has several radiocarbon dates from other sites in Missouri. At Graham Cave, two recent radiocarbon dates are 9290 $\pm$ 300 and 9470 $\pm$ 400 B.P. for the Dalton component (Crane and Griffin 1968). At Arnold Research Cave, the Dalton period component was dated at 9130 $\pm$ 650 B.P., and at Rodgers Shelter, the nearest site to the Montgomery Site with a dated Dalton component, the radiocarbon dates are 10,200 $\pm$ 300 and 10,530 $\pm$ 650 B.P. (Crane and Griffin 1968; McMillan 1971).

MONTGOMERY SITE RADIOCARBON DATE

No charcoal of sufficient weight for radiometric analysis was recovered from excavations at the Montgomery Site. However, a sample from the cutbank has been submitted for radiometric dating. The sample consists of a large fragment of a small tree trunk or branch embedded in the bank below Field 2. This sample was not recovered from a level containing the identified Dalton remains. Rather, it was recovered from the cutbank, 4.77 meters below the surface. The sample came from a point in the profile 16 centimeters above a series of layers of sand and mixed sand and clay, which differ completely from the Rodgers Alluvium from which the sample was retrieved. The present river gravels are 98 cm below the sample. Thus, the sample is near the base of the Rodgers Alluvium. A date of 9800 $\pm$ B.P. (C. V. Haynes, personal communication) should date near the beginning of the accumulation of this sediment.

The date from this sample is potentially of great value. Both the author and Collins have observed flakes and tools at this level. Using this basal date, it may be possible to calculate aggradation rates for the levels just above the river sands to the typologically dated (Dalton) cultural levels 1.5 meters above it. This will enable more direct comparisons of aggradation rates and, indirectly, of environment between the Sac River and the Pomme de Terre River. In the latter valley, McMillan (1976: 213) has calculated aggradation rates at Rodgers Shelter. He indicates that between 11,000 and 8000 years B.P. the Pomme de Terre was aggrading at a rate of 17.8 centimeters per 100 years.

THE COLLECTIONS

by

Charles D. Collins, Andris A. Danielsons,
and James A. Donohue

Five years of weekly monitoring of the site by Charles Collins and Clarence Collins, eight months of intermittent reconnaissance by Donohue and Danielsons, and occasional visits to the site by the family of Clark Montgomery, the property owner, have resulted in a collection of over 100 projectile points, plus a variety of other types of chipped stone tools. Although these of course were not all collected under contract with the Corps of Engineers, careful description and analysis of these collections is important in the interpretation of the site and in developing an accurate assessment of the impact of power releases on the site. The artifact descriptions that follow, therefore, are a result of the pooling of data from specimens in the Charles Collins collection (referenced as CC), Clarence Collins collection (PC), University of Missouri collection (MO) and the Clark Montgomery (CM) collection.

The classification system developed by Roper (1977: 37-77) for the Downstream Stockton Survey is employed here, to maximize continuity between the Downstream Stockton Survey and the Montgomery Site excavations, and to facilitate comparisons between the survey data and the excavated data. A few minor modifications have been made and several additional artifact classes are defined and described. Except for these additions, the classification system is not described here in detail. The interested reader is referred to Roper (1977: 37-77) for details. Class numbers in the following pages follow the classes defined by Roper — definitions of the classes are taken verbatim from her report.

Artifacts

CLASS 1 - POINTS - 103 Specimens

Defining Criteria: Chert as raw material; bifacially worked; haft element present; lateral margins meet in a point; broken specimens lacking the point are classed with these specimens if a haft element is present.

Type 1 - Dalton - 39 Specimens (Fig. 12 and 13, a-q)

General Description: This is a lanceolate form with a distinctive, deeply concave and, often, eared base. Haft elements generally exhibit grinding on the basal and lateral edges and most are basally thinned. The blade is straight, triangular, or excurvate. Lateral edges of the blade may be straight or convex and are often serrated. The blade itself may be heavily beveled. In Missouri, Dalton points are found at Graham Cave, Arnold Research Cave, and at Rodgers Shelter. Dates range from 10,500 to 8000 B.P. (Chapman 1975: 245).

Observations: Of the points identified here as Dalton, almost 72% are manufactured of Burlington chert. Almost all exhibit a pronounced left hand bevel (looking at the distal end of the point). All stages of resharpening noted by Goodyear (1974: 19-20) are identified at the site. Thirty-three (85%) are serrated, and 36 (92%) exhibit basal and lateral grinding. Ten specimens (26%) are complete.

Three specimens in the Dalton category are similar to the Plano-like lanceolate forms noted by Chapman (1975: 101, Fig. 5-2, and 125, Fig. 5-26). They are large, ranging from 103 to 141 mm in length. All three are concave-based, and two indicate resharpening. None has basal grinding, basal thinning, or serration. All three exhibit the collateral flaking typical of Plano technology.

A single point exhibited fine, parallel, oblique flaking; one specimen has four burin facets — two distal and two basal.

Type 2 - Graham Cave - 19 Specimens (Fig. 14)

General Description: These points are side-notched, with a basal concavity. They often exhibit prominent beveling, and many have serrated edges. Blade margins are straight, slightly convex, or recurvate. The type has been found in early levels of Graham Cave, Rodgers Shelter, and Arnold Research Cave, all in Missouri, and is associated with the Early Archaic period. Dates are estimated to range from 10,000 to 7000 B.P. (Chapman 1975: 249).

Observations: The points identified here conform nicely to descriptions in the literature. All examples have a concave base (some deeply concave) and wide side notches; some examples exhibit u-shaped notches. All of the present examples are basally and laterally ground. Blade margins are beveled. Of the 19 specimens, 7 are complete; 17 are serrated; and 11 are manufactured of Burlington chert.

Type 3 - Cache River - 7 Specimens (Fig. 15, a-f)

General Description: These points are medium or small, thin, finely worked dart points with narrow, pressure-flaked side notches. Bases are ground and straight to slightly convex. Culturally, they are affiliated with the Early Archaic period and may date 8000 B.P. or earlier (Perino 1971: 14).

Observations: The Montgomery Site specimens conform to the type description. All show a deep, narrow notch which is at right angles to the blade axis. One of those identified here is broken at the distal end and has no notches. General morphology and similarity in style of manufacture suggest its identification. Three of the seven points are of an unidentified chert type.

Type 4 - Scottsbluff - 4 Specimens (Fig. 15, g-j)

General Description: The Scottsbluff point is a finely worked point exhibiting transverse parallel flaking and weakly defined shoulders on a square or rectangular stem. The stem is generally basally and laterally ground. The point type is considered a Great Plains Paleo-Indian or Early Archaic manifestation. Dates range from 9500 to 7000 B.P. in Nebraska and Wyoming (Bell 1958: 86).

Observations: The specimens identified here are similar to the classic Scottsbluff type except they have a smaller length to width ratio (2:1 rather than 3:1 or 4:1). A single Scottsbluff point has been previously reported from Cedar County (Wood 1957: 10). The four points noted here clearly belong in the Scottsbluff Type I defined by Wormington (Wormington 1957: 267). Two of the four specimens are serrated; two specimens are manufactured from an unidentified chert.

Type 5 - Holland - 1 Specimen (Fig. 15, k)

General Description: Holland points are large, stemmed, lanceolate points technologically similar to Scottsbluff points. Stems are generally basally and laterally ground. Shoulders are relatively small. The Holland is an Early Archaic form dating approximately 9500 to 8500 B.P. (Perino 1971: 56).

Observations: The specimen identified here exhibits transverse parallel flaking and eared basal tangs.

Type 6 - Plainview - 2 Specimens (Fig. 16, b-c)

General Description: The Plainview point is lanceolate and concave based, with parallel to slightly excurvate lateral margins. It is associated with Paleo-Indian cultures in the western United States and dates to around 9000 B.P., although Bell (1958: 74) suggests it may have been in use as late as 4000 B.P.

Observations: Both points are characterized by a slightly concave base, parallel lower blade margins, and a rapid convergence toward the point. Both are basally and laterally ground and both exhibit basal thinning, with multiple flake scars somewhat parallel to the long axis of the artifact.

Type 7 - Agate Basin - 6 Specimens (Fig. 15, l-q)

General Description: Agate Basin points are long lanceolates with parallel or slightly convex lateral edges and basal grinding. They are associated with the late Paleo-Indian to Early Archaic periods, and date 9500 to 9000 B.P. (Perino 1968: 2).

Observations: The points identified here as Agate Basin are done so tentatively. Generally, they conform to the descriptions in the literature. The examples in this category are relatively long, narrow lanceolates that tend to be the widest near or above the midpoint of the blade axis. Four specimens exhibit slightly convex bases; the fifth is straight based. Flaking is generally random, although it is parallel on at least one specimen.

Type 8 - Angostura - 1 Specimen (Fig. 16, d)

General Description: Angostura points are small, narrow, lanceolate points with parallel lateral edges which incurve toward the distal end and taper towards the base. The base is usually slightly concave and exhibits no basal dulling, though the lateral edges are usually ground. The flaking pattern is often parallel oblique. These points have been radiocarbon dated at 7073 ± 300, 7715 ± 740, and 9380 ± 500 B.P. in South Dakota, but are widely distributed and are associated with the late Paleo-Indian to Early Archaic periods (Wormington 1957: 140, 269).

Observations: This specimen is only tentatively identified: the specimen exhibits heavy basal grinding and is laterally ground fully for half of its length. The point has crude parallel oblique flaking which runs from the upper left lateral margin to the lower right lateral margin.

Type 9 - Hardin - 1 Specimen (Fig. 16, n)

General Description: The Hardin point is a large, well-made point with a triangular barbed blade, and a slightly expanding rectangular base. The haft element is generally ground along the base and lateral edges (Bell 1960: 56). The Hardin point is culturally affiliated with Dalton to Early Archaic assemblages; it is estimated to date from 10,000 to 7000 B.P. (Chapman 1975: 249; Luchterhand 1970: 27-28, Fig. 6)

Observations: The specimen identified here is a good example of the Hardin Barbed as described by Chapman (1975: 249).

Type 10 - Hardaway Side-Notched - 1 Specimen (Fig. 17, c)

General Description: This is a small, broad dart point with a triangular blade. It is side-notched with an eared, concave base. The haft element is often basally and laterally ground. Hardaway points are found in Dalton period assemblages and therefore probably date from about 10,000 to 8000 B.P. (Perino 1968: 30).

Observations: Although the Hardaway point was thought to occur only in a small part of North Carolina (Coe 1954), the point identified here is almost identical to some of those described in the literature. It is interesting to note, however, that the Hardaway point is very similar to the San Patrice point found to the south and southwest of Missouri (Perino 1968: 30). The Montgomery Site specimen was manufactured from a black chert reminiscent of Pitkin chert (House 1975: 85) of the Pitkin limestone formation in southern Arkansas and central Oklahoma. Although artifacts of this material have been noted in the White River basin to the south, none has been previously observed in the Montgomery Site area. The base of this point is ground smooth, as are the ears and shallow side notches. Basal thinning is achieved by the removal of two or three flakes from either face. The thinning scars reach two-thirds of the length of the point, giving it a fluted appearance. Unlike the Hardaway points illustrated by Perino (1968: 31), the barbs are somewhat rounded. This appears to result from smoothing within the notches.

Type 11 - Rice Lobed - 4 Specimens (Fig. 17, e-h)

General Description: These are medium to large, thick points with prominent shoulders. The triangular blade is often beveled. The base is often concave, with lobed basal corners; the lateral edges of the haft element are often ground (Perino 1968: 76). The type first appears in the Dalton period but lasts until the Middle Archaic. Rice Lobed points are estimated to date from 9500 to 7000 B.P. (Chapman 1975: 254).

Observations: Three of the four specimens identified here conform to the descriptions in the literature. The fourth is Rice-like in that it generally fits previous descriptions, except for only a slightly concave base and side notches. This particular category represents the poorest workmanship in the sample. Heavy percussion flaking is indicated on two points by three or four deep primary flaking scars on one face of each specimen. All four points are serrated and beveled. The rounded shoulders and the base are ground smooth.

Type 12 - Big Sandy - 1 Specimen (Fig. 17, d)

General Description: This is a medium sized point, side-notched, and concave-based. The earliest dates suggest a Middle Archaic affiliation, although the type is associated with Early Woodland assemblages (Chapman 1975: 242).

Observations: The point identified here is lobed in appearance, and its haft element exhibits basal and lateral grinding. It exhibits uneven notching. The lobes are slightly squared and, unlike other illustrated versions, basal thinning was achieved by removing a single, large flake from the base on either face.

Type 13 - Golondrina - 1 Specimen (Fig. 16, i)

General Description: The Golondrina is a lanceolate form, concave-based and flared at the corners much like the Dalton point. The type is associated with Dalton areas in the Midwest and may be comparable in age to Plainview. Dates suggested are 9200 to 7100 B.P. (Perino 1971: 40). Therefore, they may be placed in a late Paleo-Indian to Early Archaic time period.

Observations: The specimen identified here conforms well to descriptions in the literature. The point exhibits lateral and basal grinding.

Type 14 - Wheeler - 1 Specimen (Fig. 16, j)

General description: The Wheeler point is a lanceolate form with a deep basal concavity. The basal ears tend to turn inward and the point tends to be wider below the midpoint. Occasionally, extensive lateral edge grinding is observed (Cambron 1957: 19). Its age is not known, although it has been found associated with Paleo-Indian and Early Archaic materials (Bell 1960: 94).

Observations: The point identified here is done so only tentatively. Morphologically it is similar to the Wheeler point; however, although it exhibits basal grinding, there is no lateral edge grinding.

Type 15 - Small Lanceolates - 2 Specimens (Fig. 17, a-b)

General Description and Observations: The two specimens identified here are rather small (the unbroken point is 53 mm long), well-made points. They exhibit parallel oblique flaking and heavy lateral and basal grinding. Both are shouldered, with a triangular blade with straight to slightly convex edges. Bases are straight or slightly concave and exhibit basal thinning.

Type 16 - Concave-Based Eared Lanceolates - 3 Specimens (Fig. 16, g-h)

General Description and Observations: These specimens are lanceolate, with a serrated excurvate to straight blade. Blades have a steep bevel. The haft elements are basally concave and show basal and lateral grinding and minimal basal thinning. These points have attributes of both Graham Cave and Dalton points. Although not really notched, they are incurvate-excurvate from proximal to distal ends.

Type 17 - Concave-Based Stemmed Lanceolates - 2 Specimens (Fig. 13, r-5)

General Description and Observations: These two lanceolates have a similar blade morphology. Both have convex blades, are serrated, and exhibit a pronounced right hand bevel. One of the stems is expanding, the other is straight. Both haft elements exhibit basal and lateral grinding and basal thinning. As in the preceding type, these points show affinity with characteristics of both Dalton and Graham Cave point types.

Type 18 - "Montgomery Barbed" - 3 Specimens (Fig. 16, k-m)

General Description and Observations: The name for this group of points is not intended to suggest a new point type: it is simply a convenient label for a set of attributes with which we are not familiar elsewhere. These points are of excellent workmanship and, in two cases, exhibit a small barb at the proximal end of the blade element. The lateral edges of the blade are straight and are finely serrated. The blade is triangular and shows random percussion flaking. The haft element is short relative to the length of the point. Bases are slightly concave to lobed. Two of the points exhibit basal and lateral grinding. These points show an affinity to Hardin and perhaps to Rice Lobed points.

Type 19 - Lobed Bifurcate Base - 1 Specimen (Fig. 16, e)

General Description and Observations: This untyped point is distinctive for its lobed base and shallow central basal notch. Broad deep notches separate the base and blade. The haft element is basally and laterally ground. The triangular blade is serrated and exhibits a pronounced right-hand bevel.

Type 20 - Unclassified Lanceolates - 5 Specimens (Fig. 16, a and 17, i-l)

General Descriptions and Observations: A. This is a large lanceolate point with excurvate blade edges; it lacks serrations or a bevel. The point contracts dramatically toward the proximal end. The base expands slightly and is slightly concave. The base lacks basal or lateral grinding and basal thinning. The point exhibits random percussion flaking and is plano-convex in cross section (Fig. 16, i).

TABLE 1

Attributes of Projectile Points

Catalog #	Length	Width	Thickness	Weight	Haft length	Notch width	Notch depth	Base width	Length of lat. grinding L	Length of lat. grinding R	Basal grinding	Haft morphology	Base morphology	No. of basal thinning flakes O	No. of basal thinning flakes R
CC-1	64	19	6	6.5	-	na	na	-	-	-	+	lanc	cc	-	-
CC-2	49	23	8	10	18	na	na	-	-	18	+	lanc	cc	0	3
CC-3	57	23	7	10	29	na	na	26	25	29	+	lanc	cc	0	1
CC-4	69	18	6	8.6	20	na	na	22	20	17	+	lanc	cc	0	0
CC-5	40	23	8	8	20	na	na	25	21	18	+	lanc	cc	2	2
CC-6	94	25	8	15.8	21	na	na	-	-	21	+	lanc	cc	2	0
CC-7	63	22	6	9.9	18	na	na	26	16	19	+	lanc	cc	2	1
CC-8	63	11	8	8.5	22	na	na	28	15	17	+	lanc	cc	0	3
CC-9	59	20	7	8.2	19	na	na	24	18	16	+	lanc	cc	3	3
CC-10	51	23	7	9.2	23	na	na	26	-	22	+	lanc	cc	1	4
CC-11	39	21	6	5.7	-	na	na	-	-	-	+	lanc	cc	0	3
CC-12	41	24	7	7	17	na	na	-	17	-	+	lanc	cc	-	2
CC-13	56	23	7	8.9	17	na	na	25	15	17	+	lanc	cc	0	1
CC-14	44	20	6	5.8	13	na	na	24	12	13	+	lanc	cc	0	2
CC-15	68	17	7	9.7	13	na	na	24	11	10	+	lanc	cc	2	2
CC-16	76	24	6	11.1	23	na	na	27	21	24	+	lanc	cc	1	2
CC-17	34	15	6	4.0	15	na	na	21	15	15	+	lanc	cc	0	2
CC-18	18	20	6	2.3	-	na	na	-	-	-	+	lanc	cc	-	-
CC-19	49	23	7	9.2	-	na	na	-	-	-	+	lanc	cc	-	-
CC-20	42	25	8	10.6	15	na	na	28	17	15	+	lanc	cc	3	1
CC-21	67	23	7	10.3	-	na	na	-	-	-	+	lanc	cc	-	-
CC-22	72	21	7	10	-	na	na	-	13	-	+	lanc	cc	2	3
CC-23	47	22	8	9.5	19	na	na	21	18	16	+	lanc	cc	3	4
CC-24	72	23	8	13.8	-	na	na	-	-	-	+	lanc	cc	0	2
CC-25	62	21	6	7.6	19	na	na	23	18	18	+	lanc	cc	2	2
CC-26	60	14	6	4.7	16	na	na	21	15	16	+	lanc	cc	2	1
CC-27	47	23	7	9	20	na	na	26	21	18	+	lanc	cc	1	3
CC-28	109	30	8	23.5	24	na	na	31	0	0	-	lanc	cc	0	0
CC-29	141	32	9	40	28	na	na	31	0	0	-	lanc	cc	0	0
CC-30	103	34	9	31.3	25	na	na	34	0	0	-	lanc	cc	3	3
MO-31	24	24	6	3.3	20	na	na	19	20	22	+	lanc	cc	2	3
MO-32	55	24	8	11	25	na	na	27	20	22	+	lanc	cc	3	2
MO-33	16	19	7	7.2	-	na	na	-	-	-	+	lanc	cc	3	0
MO-34	70	18	7	8.4	15	na	na	19	13	19	+	lanc	cc	3	4
MO-35	66	26	8	11.9	-	na	na	-	18	-	+	lanc	cc	3	1

Length of basal thinning flakes O	Length of basal thinning flakes R	Edge Angle L (°)	Edge Angle R (°)	Bevel direction	Serrations per centimeter	Blade morphology	Fracture type	Raw material	Heat treatment	Reworked or resharpened	Type
-	-	55	55	L	5	str	trans	Jeff	no	no	Dalton
0	16	45	38	L	4	excur	compound	Burl	no	yes	Dalton
0	18	34	35	L	3	-	trans	Burl	no	no	Dalton
0	0	47	49	L	3	str	compound	Burl	no	yes	Dalton
10	16	30	30	L	3	tri	impact	Burl	no	yes	Dalton
21	0	46	60	L	3	tri	basal	Burl	no	yes	Dalton
9	13	39	33	L	0	excur	trans	Burl	no	no	Dalton
0	15	87	83	L	0	str	N	Burl	no	yes	Dalton
17	20	51	45	L	3	tri	trans	Burl	no	yes	Dalton
13	17	45	53	L	3	tri	trans	Burl	no	yes	Dalton
0	10	55	50	L	2	tri	trans	Burl	no	yes	Dalton
-	7	36	32	L	0	excur	compound	Jeff	indet	yes	Dalton
0	12	40	52	L	3	tri	N	Burl	no	yes	Dalton
0	11	43	42	L	3	tri	impact	Burl	no	yes	Dalton
10	10	66	57	L	4	str	trans	Burl	no	yes	Dalton
17	13	47	35	L	3	excur	lateral	Jeff	yes	yes	Dalton
0	10	62	58	L	3	tri	trans	Burl	no	yes	Dalton
-	-	-	-	-	-	-	compound	Burl	no	-	Dalton
-	-	42	51	L	3	str	compound	Burl	no	yes	Dalton
15	10	65	62	L	3	str	compound	Jeff	no	yes	Dalton
-	-	65	65	L	5	tri	trans	Burl	no	yes	Dalton
10	16	64	59	L	4	str	compound	Burl	no	yes	Dalton
13	11	67	60	N	4	str	impact	Burl	indet	yes	Dalton
0	16	68	69	L	4	tri	basal	Jeff	no	yes	Dalton
10	10	49	47	L	4	excur	none	Burl	indet	yes	Dalton
12	10	58	57	L	4	str	none	Burl	no	yes	Dalton
13	11	51	51	L	4	str	compound	Burl	no	yes	Dalton
0	0	46	53	N	N	excur	N	Burl	no	no	Dalton
0	0	59	53	L	N	excur	N	?	no	no	Dalton
20	9	68	66	L	N	excur	N	Jeff	indet	yes	Dalton
16	18	-	-	L	-	-	trans	?	no	-	Dalton
15	18	55	52	L	3	excur	trans	Burl	no	yes	Dalton
15	0	64	59	L	4	str	compound	Burl	no	yes	Dalton
9	11	67	60	L	3	str	N	Burl	no	yes	Dalton
17	13	45	45	L	3	excur	basal	Burl	no	yes	Dalton

TABLE 1: Continued

Attributes of Projectile Points

Catalog No.	Length	Width	Thickness	Weight	Haft length	Notch width	Notch depth	Base width	Length of lat. Grinding L	Length of lat. grinding R	Basal grinding	Haft morphology	Base morphology	No. of basal thinning flakes O	No. of basal thinning flakes R
MO-36	109	22	7	17.2	24	na	na	23	24	25	+	lanc	cc	3	4
PC-37	61	20	7	8.9	20	na	na	23	19	20	+	lanc	cc	4	2
PC-38	71	26	7	17.2	22	na	na	26	21	22	+	lanc	cc	3	4
PC-39	67	26	7	13.4	22	na	na	27	20	22	+	lanc	cc	2	3
CC-40	91	32	8	24.5	18	6	5	29	10	12	+	nt	cc	3	1
CC-41	70	25	8	13.6	19	7	6	29	11	11	+	nt	cc	0	0
CC-42	79	29	9	22.8	19	11	4	31	8	8	+	nt	cc	0	0
CC-43	81	25	9	18	13	6	3	27	8	8	+	nt	cc	2	0
CC-44	85	27	9	17.9	20	8	3	29	12	11	+	nt	cc	0	0
CC-45	67	23	9	14	13	8	3	25	7	5	+	nt	cc	0	0
CC-46	85	19	10	16.8	17	8	3	25	10	9	+	nt	cc	0	0
CC-47	68	26	9	15.2	19	7	2	26	11	11	+	nt	cc	2	0
CC-48	74	26	8	14	15	8	3	26	8	8	+	nt	cc	0	0
CC-49	62	24	9	13.7	21	9	2	25	11	12	+	nt	cc	0	0
CC-50	60	21	9	18.4	15	7	2	26	8	8	+	nt	cc	0	0
CC-51	57	22	9	10.6	16	9	3	25	8	9	+	nt	cc	0	0
CC-52	46	20	8	7.3	17	9	4	25	8	12	+	nt	cc	1	1
CC-53	40	30	9	10.6	20	8	2	32	11	10	+	nt	cc	0	0
CC-54	27	27	8	7	19	8	3	28	9	11	+	nt	cc	0	0
MO-55	73	29	8	15.4	-	-	-	-	-	-	-	-	-	0	0
PC-56	73	27	9	17.4	17	9	2	26	9	11	+	nt	cc	0	0
PC-57	59	25	11	18.3	18	8	4	-	-	-	+	nt	cc	0	0
PC-58	73.4	25	7.7	19.6	19	6	2	-	-	7.4	+	nt	cc	0	2
CC-59	47	19	5	4.1	9	3	3	18	5	6	+	nt	cv	0	0
CC-60	56	29	7	11.7	14	3	4	28	0	0	N	nt	cv	0	0
CC-61	58	23	6	7.4	9	2	5	22	0	0	+	nt	cv	0	0
CC-62	87	30	8	19.4	11	3	5	25	7	6	+	nt	cv	0	0
CC-63	62	21	6	7.5	8	3	4	21	0	0	+	nt	str	0	0
CC-64	48	22	6	7.7	10	5	3	20	0	0	+	nt	cc	0	0
CC-65	44	27	6	9.1	-	na	na	25	0	0	N	nt	cc	0	0
CC-66	39	24	5	4.7	8	na	na	21	13	10	+	lanc	cc	4	4
CC-67	47	26	5	21	15	na	na	23	9	10	+	lanc	cc	3	2
CC-68	46	26	7	7.4	12	na	na	22	8	7	+	lanc	cc	4	3
CC-69	53	22	6	7.7	16	na	na	23	15	16	+	lanc	cc	0	0
CC-70	32	19	6	5	20	na	na	20	17	20	+	lanc	cc	3	4

Length of basal thinning flakes O	Length of basal thinning flakes R	Edge Angle L (°)	Edge Angle R (°)	Bevel direction	Serrations per centimeter	Blade morphology	Fracture type	Raw material	Heat treatment	Reworked or resharpened	Type
16	8	57	63	L	3	str	N	Jeff	no	yes	Dalton
14	13	56	56	L	4	excur	N	Burl	no	yes	Dalton
11	8	48	53	L	5	excur	impact	Jeff	no	yes	Dalton
11	17	71	75	L	4	str	trans	?	indet	yes	Dalton
8	5	50	48	N	4	excur	N	Jeff	indet	no	Graham Cave
0	0	67	56	L	3	str	trans	unk	yes	yes	Graham Cave
0	0	41	43	R	3	excur	compound	Burl	no	yes	Graham Cave
7	0	47	41	N	9	str	N	Burl	yes	yes	Graham Cave
0	0	46	40	N	3	tri	N	Burl	no	no	Graham Cave
0	0	40	44	R	3	str	N	Jeff	yes	yes	Graham Cave
0	0	51	51	R	4	str	N	Jeff	no	yes	Graham Cave
17	0	52	56	L	3	str	impact	Jeff	no	yes	Graham Cave
0	0	55	51	R	4	str	N	Burl	no	yes	Graham Cave
0	0	49	51	R	3	excur	trans	Burl	no	yes	Graham Cave
0	0	48	49	N	3	str	trans	Jeff	no	no	Graham Cave
0	0	62	66	R	4	str	impact	Jeff	indet	yes	Graham Cave
9	8	53	52	N	3	str	impact	Burl	no	yes	Graham Cave
0	0	35	46	N	0	str	trans	Burl	no	no	Graham Cave
0	0	48	55	R	0	-	trans	Burl	no	yes	Graham Cave
-	-	44	47	R	4	tri	compound	Burl	no	yes	Graham Cave
0	0	62	63	R	9	tri	N	Jeff	no	yes	Graham Cave
0	0	54	63	L	4	str	compound	Burl	no	yes	Graham Cave
0	16	59	55	L	3	str	compound	Burl	no	yes	Graham Cave
0	0	47	47	N	N	excur	N	Burl	no	yes	Cache River
0	0	37	36	N	N	tri	trans	?	no	no	Cache River
0	0	35	35	N	N	excur	impact	?	indet	no	Cache River
0	0	34	32	N	N	excur	N	Jeff	no	no	Cache River
0	0	45	38	N	N	tri	N	Jeff	no	no	Cache River
0	0	39	39	N	N	excur	compound	Jeff	no	no	Cache River
0	0	36	33	N	N	excur	trans	?	no	no	Cache River
24	21	50	54	N	N	tri	N	?	no	yes	Hardaway
7	9	28	24	N	N	excur	N	Jeff	no	yes	Plainview
17	15	35	31	L	N	excur	N	?	no	yes	Plainview
0	0	46	45	L	N	excur	N	?	no	yes	Small lanceolate
15	12	45	44	L	N	excur	trans	?	indet	yes	Small lanceolate

TABLE 1: Continued

Attributes of Projectile Points

Catalog No.	Length	Width	Thickness	Weight	Haft length	Notch width	Notch depth	Base width	Length of lat. grinding L	Length of lat. grinding R	Basal grinding	Haft morphology	Base morphology	No. of basal thinning flakes O	No. of basal thinning flakes R
CC-71	44	18	6	6.3	13	na	na	18	13	14	+	lanc	str	0	0
CC-72	125	36	9	42.2	45	na	na	18	39	44	+	lanc	cv	0	0
CC-73	58	27	9	16	16	10	3	26	10	9	+	nt	cc	2	2
CC-74	77	27	9	19.3	14	13	4	24	12	14	+	stem	cc	3	2
CC-75	78	25	9	17.9	13	na	na	20	0	0	N	stem	cc	4	3
CC-76	93	35	8	28	17	na	na	30	17	15	+	stem	str	0	0
CC-77	88	38	8	29.7	15	na	na	37	15	15	+	stem	str	0	0
CC-78	75	38	9	23.5	15	na	na	34	15	15	+	stem	str	0	0
CC-79	73	39	7	20.5	-	na	na	-	-	-	-	stem	-	0	0
PC-80	112	31	7	27.9	18	na	na	27	18	18	+	stem	cc	0	0
CC-81	68.3	27	7.9	17.7	7	na	na	19	0	0	+	lanc	cc	1	0
CC-82	62	28	5.7	15	23	na	na	19	23	15	+	lanc	cc	0	0
CC-83	87	29	9.7	27.8	23	na	na	18	23	27	+	lanc	cc	3	1
CC-84	82	26	8.5	23.3	49	na	na	17	46	47	+	lanc	str	0	0
CC-85	90.5	23	6.4	18	40	na	na	16	41	42	+	lanc	str	0	0
CC-86	73.4	23	7.7	16.8	-	na	na	-	-	-	-	lanc	-	0	0
CM-87	91	27	9	21	23	na	na	16	23	25	+	lanc	excur	1	3
CC-88	89.4	43	10.5	32.8	13	na	na	32	10	11	+	stem	lobed	0	2
CC-89	73.2	43	9.3	24.9	12	na	na	29	0	0	N	stem	str	0	1
CC-90	59	37	8.8	17.4	12	na	na	29	0	0	N	stem	str	0	1
CC-91	92.3	38	8.9	25.9	17	na	na	27	0	0	+	nt	cc	1	0
CC-92	79.4	36	8	23	11	na	na	25	11	9.4	+	nt	lobed	0	0
CC-93	96.9	33	8.4	30.2	11	na	na	26	11	11	+	nt	lobed	0	0
MO-94	82.6	39	6.3	22	11	na	na	25	11	11	+	nt	lobed	0	1
CC-95	67.5	22	9.6	14.9	36	na	na	19	34	35	+	lanc	cc	0	0
CC-96	74.5	21	8	17.4	13	-	-	-	13	-	+	lanc	cc	0	2
CC-97	78.3	22	7.3	15.5	17	-	-	27	21	17	+	lanc	cc	0	0
CC-98	92.4	23	9.7	25	17	10	2	25	19	17	+	nt	cc	1	0
CC-99	111	34	10	38.9	21	na	na	19	18	29	+	lanc	cv	0	0
CC-100	91.6	34	6.7	22.9	16	na	na	24	N	N	+	lanc	cc	0	0
PC-101	90	28	7.4	20.8	32	N	na	23	N	N	+	lanc	cc	1	0
CC-102	72	30	8.5	16.1	17	5	10	-	-	7.3	+	nt	cc	2	0
PC-103	40	33	8	11.4	12	8	3	30	13	12	+	nt	cc	0	1

Length of basal thinning flakes O	Length of basal thinning flakes R	Edge Angle L (°)	Edge Angle R (°)	Bevel direction	Serrations per centimeter	Blade morphology	Fracture type	Raw material	Heat treatment	Reworked or resharpened	Type
0	0	52	59	N	N	excur	compound	?	no	yes	Small lanceolate
0	0	44	46	N	N	excur	N	Burl	no	no	Shouldered biface
31	17	55	50	R	N	excur	N	Burl	indet	yes	Big Sandy
13	17	66	60	R	3	str	trans	Burl	no	yes	Expanding stem concave base
20	12	70	65	R	4	str	trans	Jeff	no	yes	Straight stemmed concave base
0	0	38	36	N	N	excur	N	Jeff	indet	no	Scottsbluff
0	0	37	38	N	N	excur	N	?	yes	no	Scottsbluff
0	0	38	36	N	5	excur	N	?	no	no	Scottsbluff
0	0	32	30	N	N	excur	trans	?	no	no	Scottsbluff
0	0	37	34	N	N	excur	basal	?	no	no	
15	0	59	69	N	N	excur	N	Jeff	no	yes	Agate Basin
0	0	50	49	N	N	excur	trans	Burl	yes	yes	Agate Basin
14	7.5	65	72	N	N	str	N	Burl	yes	yes	Agate Basin
0	0	55	60	N	N	excur	compound	?	no	no	Agate Basin
0	0	52	55	N	N	str	N	?	no	no	Agate Basin
0	0	61	58	N	N	str	compound	Jeff	no	no	Agate Basin
9	10	53	54	N	N	excur	N	Jeff	no	yes	Agate Basin
0	18	52	59	L	2	tri	N	Burl	no	yes	Rice lobed
0	27	62	75	N	4	tri	lateral	Jeff	no	yes	Rice lobed
0	42	71	64	N	2	tri	impact	Chou	yes	yes	Rice lobed
11	0	50	41	N	N	tri	N	Chou	indet	yes	Hardin barbed
0	0	60	59	R	5	tri	lateral	?	no	yes	Montgomery
0	0	45	56	N	3	tri	impact	Burl	no	yes	Rice lobed
0	24	45	45	N	N	tri	N	Burl	no	yes	Montgomery
0	0	56	60	N	N	str	N	Jeff	no	yes	Angostura
0	16	59	55	N	4	str	compound	Burl	no	yes	Concave base eared lanceolate
10	0	60	50	R	4	str	compound	Burl	no	yes	cc base eared lanc.
10	0	63	67	R	2	excur	trans	Burl	no	yes	cc base eared lanc.
0	0	50	60	N	N	excur	N	Jeff	no	no	Unclassified
0	0	57	54	R	N	excur	N	Jeff	no	yes	Wheeler
15	0	47	46	N	N	excur	N	Jeff	no	no	Golondrina
11	0	52	52	R	3	tri	basal	Burl	no	yes	Bifurcate base
0	22	59	55	N	3	-	trans	Jeff	no	-	Rice lobed

TABLE 1: Continued

Attributes of Projectile Points

Key:

L - Left

R - Right

N - None

str - Straight

excur - Excurvate

tri - Triangular

na - Not applicable

nt - Notched

cc - Concave

cv - Convex

trans - transverse

indet - indeterminate

O - Obverse

R - Reverse

Jeff - Jefferson City

Burl - Burlington

Chou - Chouteau

B. This finely worked lanceolate of oolitic chert exhibits straight lateral edges and parallel transverse flaking. The proximal end is slightly constricted and the base is convex. The base is ground and the grinding continues only a short distance (6 mm) laterally toward the distal end (Fig. 17, j).

C. This is a large lanceolate point exhibiting random percussion flaking. The blade lacks a bevel or serrations. The point has been broken at 2/3 the distance to the tip but both parts were collected. The base is slightly concave and exhibits basal and lateral grinding. The base and lateral margins of the haft element appear unfinished. This may be a Dalton point broken during manufacture (Fig. 17, k).

D. This is a small (44 mm) lanceolate, incurvate-excurvate from base to distal end. The blade shows heavy distal wear and, generally, random percussion flaking. The slightly eared base is ground and exhibits a small nipple extruding from the center of the base (Fig. 17, l).

E. This is a large lanceolate point (not illustrated) with straight lateral edges. It lacks basal or lateral grinding. The base is straight. The flaking is crude parallel percussion and the blade lacks serrations. The specimen has a transverse fracture at the midsection. This is probably an uncompleted point.

Type 21 - Shouldered Biface - 1 Specimen (Fig. 16, f)

General Description and Observations: This point was found <u>in situ</u> 5.56 m below the present surface, which places it below other artifacts found in the cutbank at the site and below the location of the radiocarbon sample. It is a large (125 mm long) point,

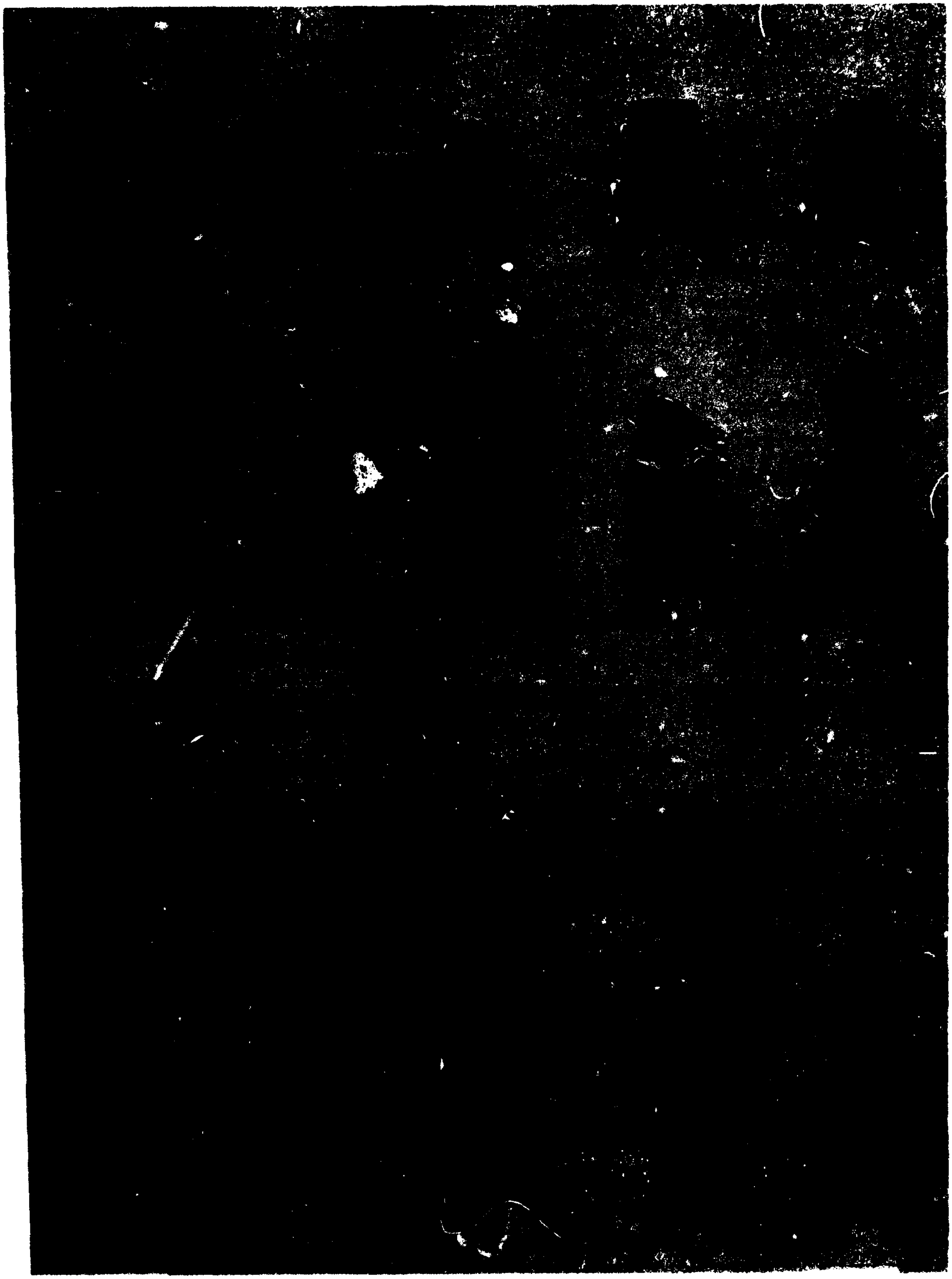


Figure 12. Dalton points from the Montgomery Site.

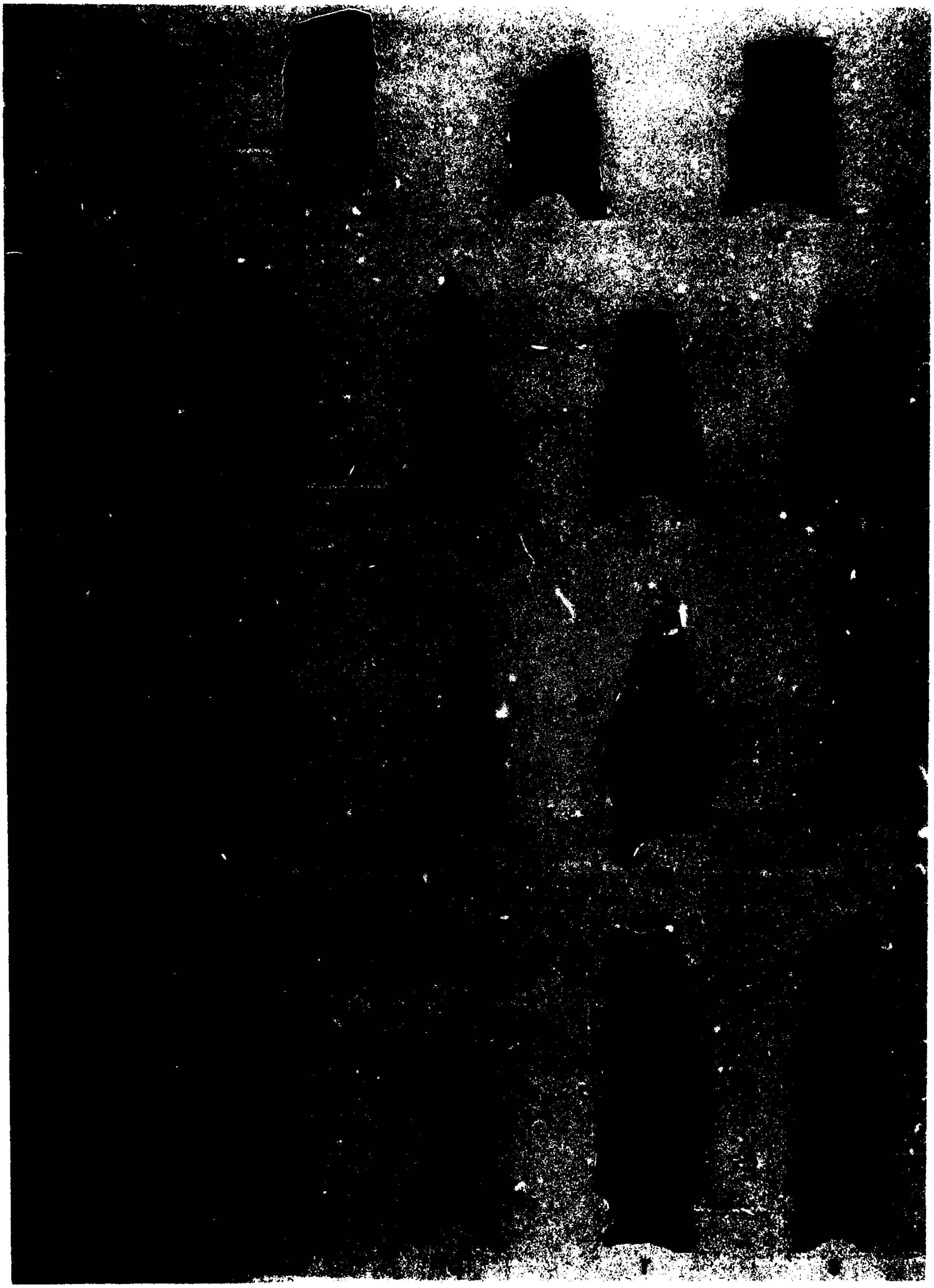


Figure 13. Dalton points (a-q); and concave-based stemmed lanceolates (r-s).

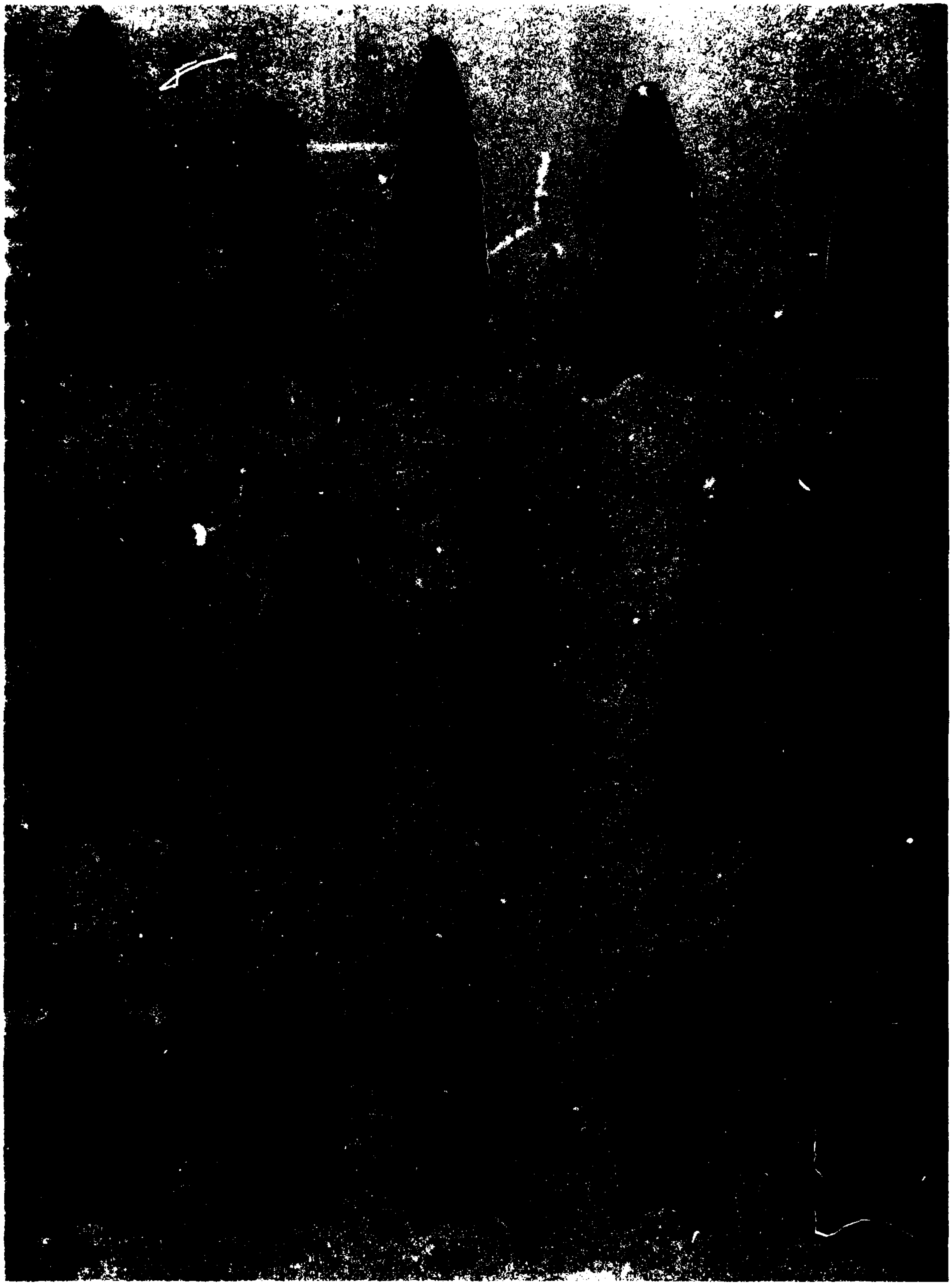


Figure 14. Graham Cave points from the Montgomery Site.

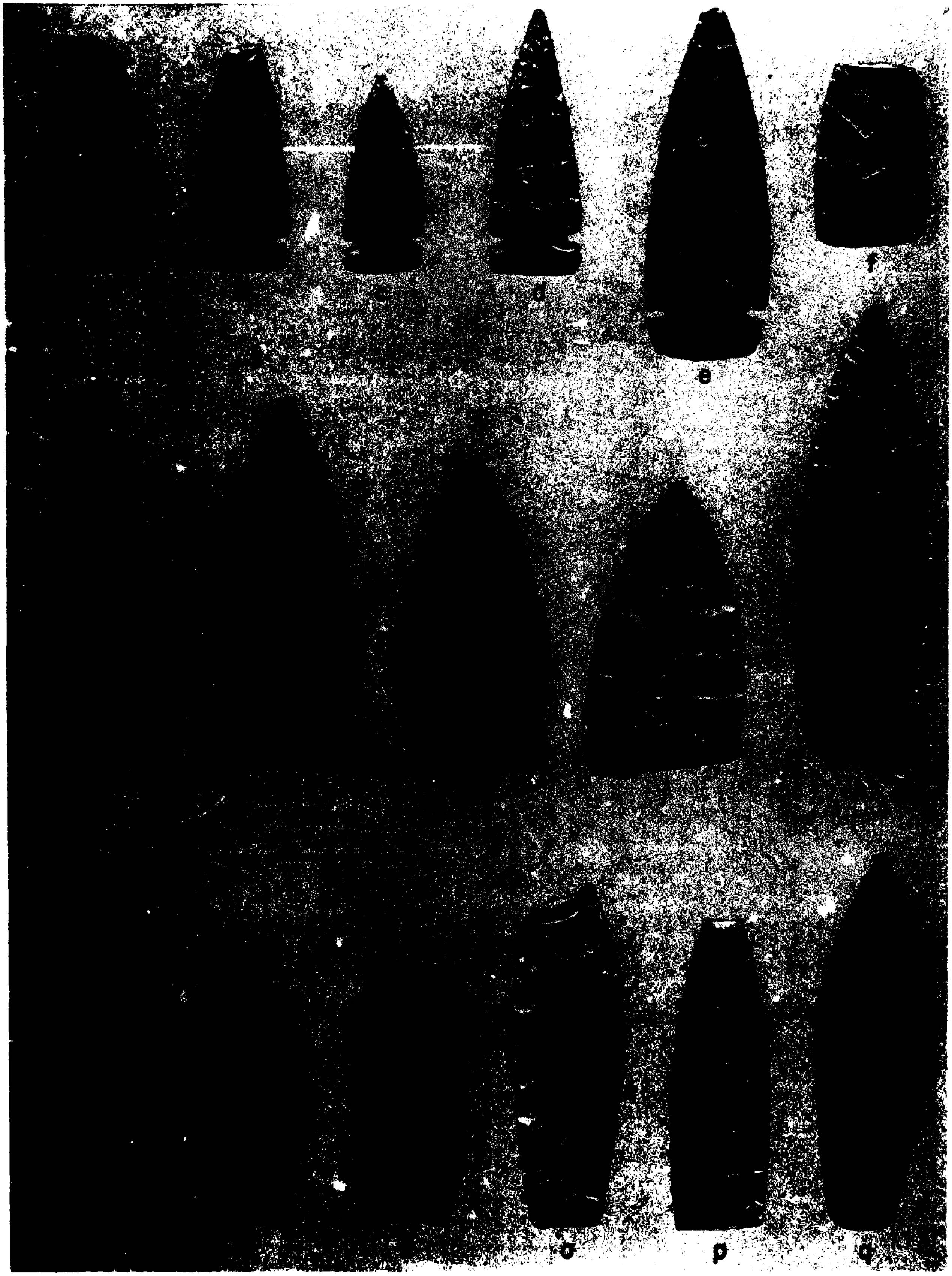


Figure 15. Cache River points (a-f); Scotts Bluff points (g-j); Holland point (k); and Agate Basin points (l-q).

Figure 16. Unclassified lanceolate (a); Plainview points (b-c); Angostura point (d); Lobed bifurcated base point (e); Shouldered biface (f); Eared lanceolate points (g-h); Golondrina point (i); Wheeler Point (j); "Montgomery Barbed" points (k-m); and Hardin point (n).

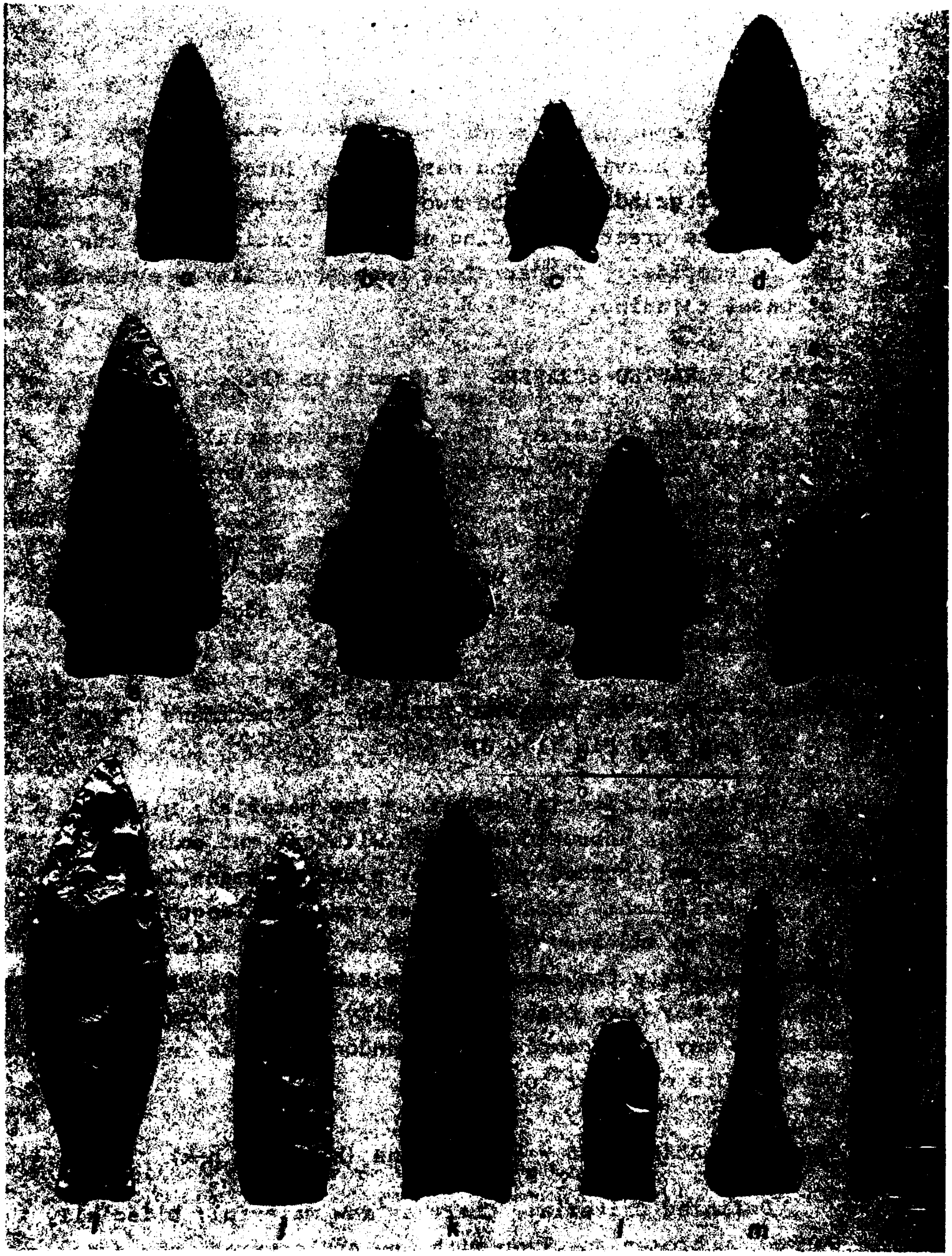


Figure 17. Small lanceolate points (a-b); Hardaway point (c); Big Sandy point (d); Rice Lobed points (e-h); Unclassified lanceolate points (i-l), and drills (m-n).

exhibiting apparently random percussion flaking. The specimen is heavily ground basally and laterally. The lengths of grinding on the two lateral edges are not equal — the greater grinding distance continuing to the single shoulder. The straight base shows little evidence of basal thinning.

CLASS 2 - HAFTED SCRAPERS - 2 Specimens (Fig. 18, a-b)

Defining Criteria: Chert as raw material; bifacially or unifacially worked; single steep unifacially beveled transverse edge.

Description: One of the specimens is bifacially worked, but only on the proximal end of the tool. The working edge on both is convex. Working edge angles are 60° and 70°.

CLASS 3 - POINTED, UNHAFTED BIFACES - 8 Specimens (Fig. 18, k-n) and Fig. 19, d)

Defining Criteria: Chert as raw material; bifacially worked; unbroken specimen with one end pointed, the other end rounded or square; a haft element lacking.

Description: These examples range in length from 79 to 146 mm and in width from 29 to 51 mm. Although morphologically the artifacts are similar, the various specimens may have been functionally diverse. Several examples may be incomplete or abandoned stages in the manufacture of other tools.

CLASS 4 - AXES/ADZES - 9 Specimens (Fig. 19, h-k)

Defining Criteria: Chert as raw material; bifacially worked; unbroken specimen with one end squared, one end rounded.

Description: These tools range in length from 77 to 119 mm and in width from 36 to 71 mm. Lateral margins on these artifacts are straight to convex. All but two of the specimens exhibit grinding, particularly on the rounded or poll end. Three of the specimens also exhibit use polish on the square end. Edge angles on the bit or square end range from 50° to 80°. One specimen is broken; however, it conforms so closely to class characteristics that it was thought justified to include it here. All but one of the bit ends of the unbroken examples are convex; the other one is concave.

CLASS 5 - OVOID BIFACES - 3 Specimens (Fig. 19, a-b)

Defining Criteria: Chert as raw material; bifacially worked; an unbroken specimen has two rounded edges.

Description: These tools range in length from 44 to 70 mm and in width from 23 to 39 mm. Lateral edges are straight to convex. These tools are not ground. Two of the three specimens retain cortex material.

CLASS 6 - POINTED END SEGMENTS - 29 Specimens (Fig. 19, e, f, g)

Defining Criteria: Chert as raw material; bifacially worked; the broken specimen is truncated by a single transverse or oblique fracture with retained portions of lateral margins meeting in a point.

Description: The lateral margins of these tool fragments are straight to convex. Grinding is not evident on any specimen. Eight of these fragments are probably the distal end of Class 3 artifacts; the rest are probably the distal end of Class 1 artifacts. One of the remaining 16 specimens shows an impact fracture, and two have been burinated at the extreme distal end, each with one burin facet. Thirteen of these Class 1 distal fragments are serrated. The general morphology and technology of the serrated fragments suggest Dalton or Graham Cave points.

CLASS 7 - SQUARED END SEGMENTS - 11 Specimens (Fig. 20, c, e)

Defining Criteria: Chert as raw material; bifacially worked broken specimen, truncated by a single transverse or oblique fracture, retaining portions of both lateral edges in addition to a straight extreme end.

Description: Retained lateral margins are straight to slightly convex; none of the specimens exhibit grinding. It is felt that these are broken specimens of Class 3 artifacts and, as with Class 3 tools, several tool types are represented. Some may be fragments of completed tools; others are probably representative of stages in the manufacture of uncompleted artifacts.

CLASS 8 - ROUNDED END SEGMENTS - 6 Specimens (Fig. 20, d)

Defining Criteria: Chert as raw material; bifacially worked; broken specimen is truncated by a single transverse or oblique fracture; portions of both lateral margins retained, rounded and continuous with end margin.

Description: Lateral margins on all but one specimen are convex, although the one specimen with straight lateral edges is not clearly defined, fitting between Classes 7 and 8. This specimen and one finely worked, relatively thin segment are both ground over the full extent of remaining edges.

CLASS 11 - MEDIAL SEGMENTS - 6 Specimens (Figure 19, c)

Defining Criteria: Chert as raw material; bifacially worked; broken specimen has two parallel transverse fractures; both ends are lost but portions of both lateral margins remain.

Description: Lateral margins of these fragments are straight to slightly convex. Five of these specimens exhibit serrations of the remaining lateral margins, suggesting that they may be medial sections of Class 1 artifacts. The remaining fragment is heavily ground on its lateral margins and is a heavier tool than the others. A large hinge fracture obscures one face.

CLASS 13 - MISCELLANEOUS - 6 Specimens

Defining Criteria: Definitely bifacially worked fragments of chert, but so fragmentary as to preclude assignment to any other class.

Description: One of these specimens is ground and resembles the barb of a Class 1 tool.

CLASS 14 - SCRAPERS - 8 Specimens (Fig. 18, c-j)

Defining Criteria: Chert as raw material; unifacially worked; steep beveled edge.

Description: All specimens are made from flakes. Seven of the scrapers have their primary working edge on the distal end of the flake, although one of these exhibits a spokeshave on the side. Edge angles range from 45° to 80°. The scraper with the lateral spokeshave had a distal edge angle of 45°; the edge angle of the spokeshave is 75°. Four of the remaining scrapers have working edges only on the lateral edges of the flake; one of these is steeply beveled on both lateral margins. The remaining two scrapers are made from very thick flakes and are steeply beveled (70° and 85°). Both of these exhibit graver spurs near the ventral surface of the flake. Three scraper types identified in the collections include flake scrapers, snubbed-end scrapers, and a small, bell-shaped variety of scraper. Both the snubbed-end and bell-shaped categories are characterized by spurs along one or both margins of the working edge. This is especially notable on the small form. Graver spurs are common on unifacial tools during the Paleo-Indian period.

CLASS 15 - RETOUCHED AND/OR UTILIZED FLAKES - 7 Specimens (Fig. 20, a-b)

Defining Criteria: Chert as raw material; working edge consists exclusively of retouch and/or utilization along the margins of one face only.

Description: Three of the specimens were used on three edges, one was worked on two edges, and the remaining three were used on one edge only. None of these were used on the proximal end. When two edges were utilized the lateral edges were preferred. One of the specimens exhibits a gouge-like bit of working edge and one is backed.

CLASS 16 - CORES - 4 Specimens (Fig. 20, f-g)

Defining Criteria: Chert as raw material; large angular piece of chert, not bifacially or unifacially worked but, rather, flakes taken from all surfaces.

Description: Three of the cores are of Burlington chert. Two of these were river cobbles; the other is probably of quarried Burlington chert. The remaining core is tabular in form and may be of Burlington chert. All retain some cortex.

CLASS 17 - CHERT HAMMERSTONES - 1 Specimen (Fig. 20, h)

Defining Criteria: Same as Class 16, but with battering along one or more platform margins.

Descriptions: This specimen is a complete cobble, rounded, with no evidence of purposeful removal of flakes. Battering is heavy over at least 75% of the surface. Some cortex is retained. The maximum diameter is 62 mm, minimum diameter, 47 mm.

CLASS 27 - DRILLED STONE - 3 Specimens (Fig. 20, i)

Defining Criteria: Sandstone as raw material; exhibits symmetrical circular depressions; depressions sometime exhibit circular striations and lack pitting or battering.

Description: All three of the specimens are made of sandstone; two exhibit a single depression, one is multiple. The diameters of the depressions on the multiple drilled example are 26, 28, and 30 mm; depths are, respectively, 9, 12, and 18 mm. The edges of the stone which exhibit multiple drilling are ground smooth. All three depressions exhibit circular striations. The two singly drilled specimens are more massive. The diameters of the drilled depressions are 32 and 35 mm, and depths of depressions are 20 and 23 mm, respectively. These two stones are of a softer sandstone. One of them exhibits pecking in a tight pattern near the extant depression, perhaps indicating an initial stage in the preparation of a new depression.

CLASS 28 - DRILL - 3 Specimens (Fig. 17, m-n)

Defining Criteria: Chert as raw material; bifacially worked; exhibits haft element. Long, narrow, parallel lateral edges have a biconvex cross section.

General description: The first specimen appears to be a reworked Dalton point in the final stage of resharpening (Goodyear 1974: 30-31). The distal portion is rounded and serration is absent. The concave base and haft margins are heavily ground (Fig. 17, n).

The second specimen is large, narrow bladed, and has an expanding base. The lateral edges of the artifact are straight and show crude parallel flaking. When viewed from the distal end, the specimen exhibits a slight right hand bevel. The haft element is basally and laterally ground and has a straight base (Fig. 17, m).

The third example is a medium-sized lanceolate specimen with straight lateral edge margins. The slightly concave base exhibits heavy basal and lateral grinding. Shoulders are faintly visible. The point exhibits fine parallel flaking and lacks a bevel or serrations.

Figure 18. Hafted scrapers (a-b); Scrapers (c-j); and pointed bifaces (k-n).

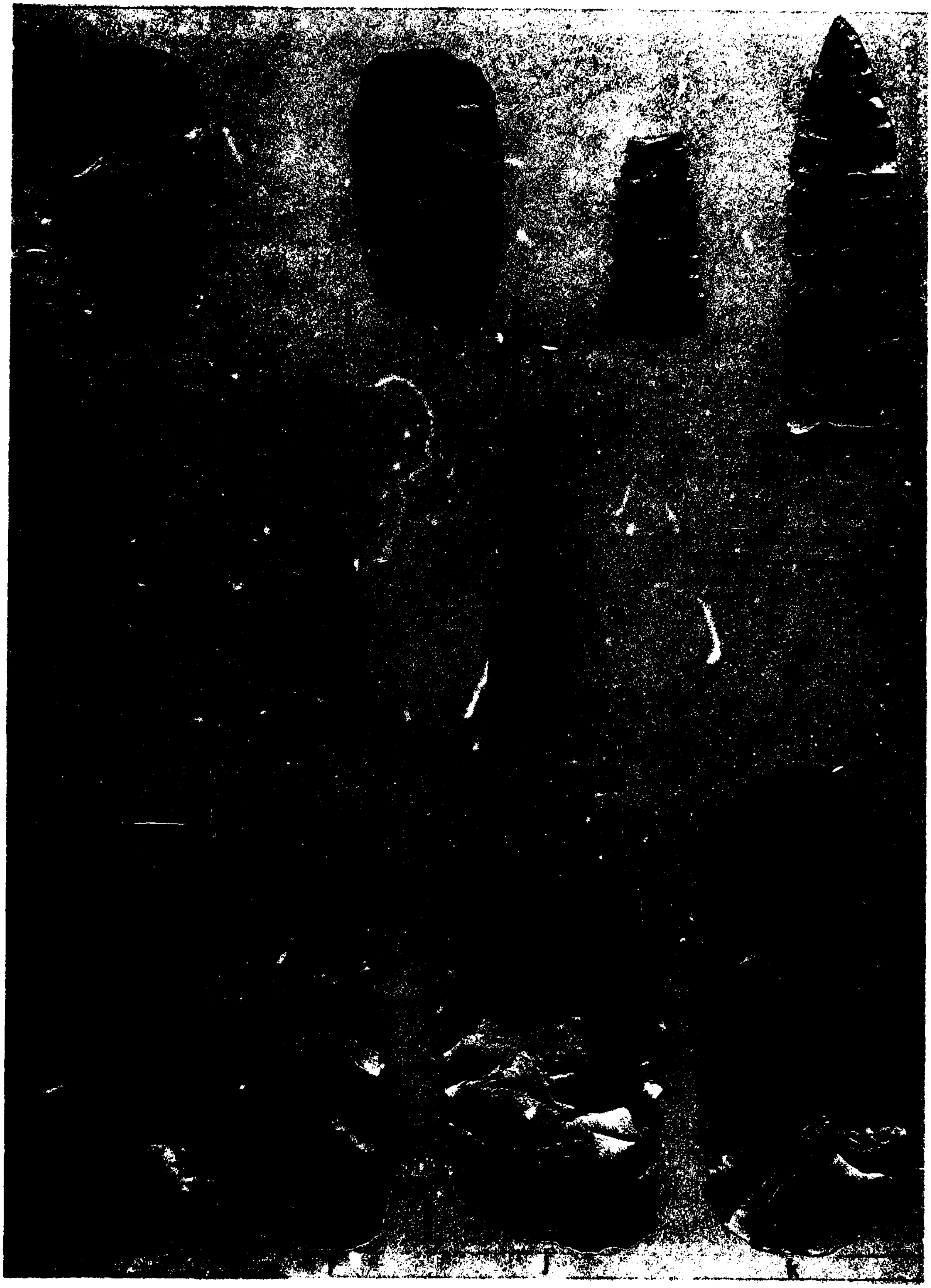


Figure 19. Ovoid bifaces (a-b); Medial segment (c); Pointed biface (d); Pointed End segments (e-g); and axes/adzes (h-k).

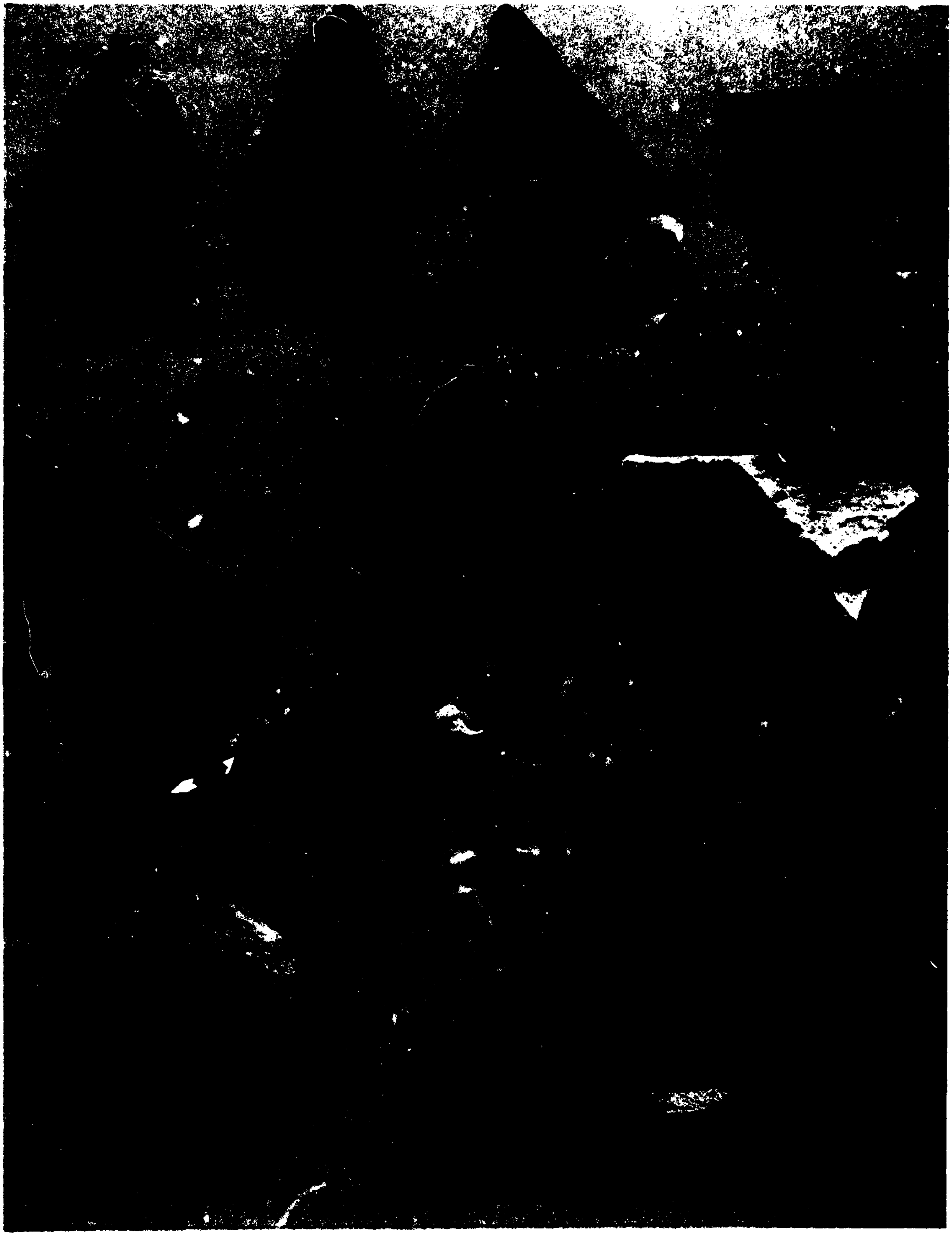


Figure 20. Retouched and/or utilized flakes (a-b); Squared end segment (c, e), Cores (f-g); Hammerstone (h); and Drilled stone (i). Rounded end segment (d).

Debitage

Six classes of debitage are used in this analysis. It is assumed that three of these classes relate directly to stage of manufacture. The presence of large flakes and cortex flakes is taken to represent primary manufacture. Presence of large quantities of small pieces of debris is inferred to represent a later stage of manufacture or tool maintenance. Medium sized flakes, unclassifiable fragments, and shatter are not considered diagnostic of a manufacturing stage.

None of the excavated units revealed tools; conversely, none of the described surface collections include debitage. The above artifact descriptions are therefore based entirely on surface collections; the following debitage descriptions, obviously, entirely on excavated materials. The preliminary remarks to the artifact descriptions apply to the excavated debitage as well.

CLASS 18 - SHATTER - 46 Specimens

Defining Criteria: Chert as raw material; angular pieces of chert, broken along more or less straight cleavage planes with no bulbs of percussion or striking platforms.

Description: Shatter is a by-product of the chipping process. When chert is struck, particularly in early stages of modification, a number of pieces may be knocked off. Some of these are not directly struck off but are rather dislodged by shock. These pieces retain no striking platform or bulb of percussion, either positive or negative. This class includes shatter of all sizes.

CLASS 19 - CORTEX FLAKES - 19 Specimens

Defining Criteria: Chert as raw material; unworked; retains a striking platform and bulb of percussion and/or rippling on the ventral face indicating it is the result of a direct blow; cortex covers the entire dorsal face.

Description: Cortex flakes in the present collection vary in size, but all meet the above criteria.

CLASS 20 - PRIMARY FLAKES - 57 Specimens

Defining Criteria: Chert as raw material; unworked; retains a large flat striking platform and prominent bulb of percussion; length of force axis is over 50 mm.

Description: Primary flakes may or may not retain cortex. When they do it does not cover the entire dorsal surface.

CLASS 21 - SECONDARY FLAKES - 208 Specimens

Defining Criteria: Chert as raw material; unworked; retains striking platform and bulb of percussion; length of force axis is greater than 20 mm and less than 50 mm.

CLASS 25 - TERTIARY FLAKES - 180 Specimens

Defining Criteria: Chert as raw material; unworked; retains a striking platform and bulb of percussion; length of force axis is under 20 mm.

Description: Tertiary flakes do not retain cortex. Bulb of percussion is often small; presumably tertiary flakes are often "pressure flakes."

CLASS 26 - FRAGMENTS - 325 Specimens

Defining Criteria: Chert as raw material; lacks striking platform and bulb of percussion; breakage prohibits classification as to flake type, but often have ripples on the ventral side.

Raw Material

In addition to the morphological description, debitage was macroscopically classified by inferred geologic source (principally Burlington or Jefferson City formations) using the attributes of color and general internal characteristics. It must be emphasized, however, that this is only a preliminary classification and will probably be revised in future studies.

One of the striking attributes of the assemblages from the test excavations is the extreme homogeneity of the chert types. The BT-1 and BT-1A materials, in fact, are so similar they appear to have been struck from the same core. Trace element analysis was attempted in order to demonstrate or refute this idea but, unfortunately, a computer malfunction destroyed the results of the analysis before they could be evaluated. It is hoped that the analysis will be redone at a later date.

On a broader scale, examination of cores and cortex suggests two chert procurement modes represented at the site. The majority of the chert was probably derived from river cobbles obtained directly from the Sac River bed. Observations on the cortex from debitage from BT-1 and BT-1A indicate that at least this Burlington chert was quarried and brought to the site to be worked. The thick spongy white cortex shows no evidence of river smoothing or polishing. The locations of possible quarrying stations are, however, as yet unknown.

On the whole, there appears to have been a preference for the use of high grade Burlington chert for Dalton artifacts. This preference is seen in both the Collins and University of Missouri collections. Price and Krakker (1975) also found that an apparent selection for particular cherts was practiced by the Dalton inhabitants of the Little Black River in southeast Missouri.

Technology

A further set of preliminary observations was made on the presence or absence of lipping on flakes retaining the striking platforms and bulbs of percussion. The assumption was that this attribute had technological significance. For example, Crabtree (1972) associates lipping with soft hammer or baton flaking. Similarly, Henry, Haynes, and Bradley (1976) found that soft hammer technology produced lips on 19.6% of the flakes they examined, while lips occurred on hard hammer flakes only 1.3% of the time.

At the Montgomery Site, flakes with lips were produced in very high frequencies. Of all the flakes recovered from BT-1 and BT-1A test excavations, 63% and 68% were lipped. Of the total number of flakes recovered from the BT-4 excavation 57% had lips. This strongly suggests a soft hammer percussion technology.

DISTRIBUTIONS

Survey

by

Charles D. Collins

Survey techniques used in recording the provenience of artifacts collected during the continuing five-year reconnaissance of the Montgomery Site were described at the beginning of this report. In this section, we present descriptions of the distributions of this material along the cutbank of the Sac River as they have been mapped over the last five years. These are presented according to the categories described in the previous section of this report. A map showing the location of all points recorded in place is presented in Figure 21 (in pocket).

PROJECTILE POINTS

Dalton

Dalton points are the most widespread and prevalent artifacts in the collection. Nine specimens were recorded at depths ranging from 2.9 m (9.6 ft) to 4.0 m (13 ft). They are represented throughout the full length of the cutbank, but there is a higher density along the downstream (north) portion of the site.

Graham Cave

Distribution of this category was similar to that for Dalton and, in one instance, it appeared coextensive with the Dalton. Graham Cave and Dalton points found at the upper margin of the site were at the same depths and were separated by 2.5 cm (1 inch) horizontally. Only two Graham Cave specimens were found in situ, both at an average depth of 3.4 m (11 ft).

Cache River

A single Cache River specimen was found in situ at a depth of 2.8 m (9.3 ft). Six of the seven points in this category were in two distinct clusters along the upstream portion of the site. The seventh specimen was in the river channel but close enough to the other two points to imply a similar provenience.

Scottsbluff

Clustering can also be noted for the Scottsbluff points. A single specimen was recorded in situ at a depth of 3.7 m (12 ft). Two other complete points and a third (which is missing a portion of the base) were found a short distance downstream at the water's edge.

Agate Basin

The five points classed as Agate Basin were widely distributed in the site. Three points are complete, a fourth is missing a small portion of the distal end, and the fifth is missing both the basal and distal parts. A single specimen was found at a depth of 3.2 m (10.5 ft) below the present terrace surface. No association with the other categories was indicated by the distribution of this type.

Plainview

A single Plainview point was found at a depth of 3.8 m (12.5 ft), but a second example, slightly deeper, may also have been *in situ*. Since the vertical provenience is questionable, its depth is not included here. The two points were found in close proximity – an indication that they may have occurred together. They were near the center of the site.

Rice Lobed

Two of the four Rice Lobed points were found *in situ*: one at 2.7 m (8.6 ft) below the surface, the other at 2.4 m (8.0 ft) below the surface. These are shallower than artifacts in the other classes. The two specimens not found in place were in the stream channel.

Angostura

The single Angostura point was found near the water along the downstream margin of the site.

Hardaway

The single Hardaway point was found on a small gravel bar in the river channel adjacent to the site.

Hardin

The single Hardin point was found in the river channel in shallow water.

Wheeler

This single point was recovered from a slump along the central part of the site. Associated with this specimen were the basal sections of several preforms.

Big Sandy

The location of this artifact was not included on the distribution map (Fig. 21). It was recovered from the stream gravel near the right bank at the downstream margin of the site. Since the specimen was found across the river from the site, its association may be questionable. However, studies of cross currents associated with erosional processes in a meander (Leopold, Wolman, and Miller 1964: 299-301) tend to support the idea that considerable quantities of eroded material are transported across the river channel and deposited on the inside (point bar) of the meander. Furthermore, many waste flakes were found along the right margin of the channel.

Concave Based Eared Lanceolate

These two artifacts were found in close association at the downstream margin of the site. A single specimen occurred in situ at a depth of 3.4 m (11 ft). The distal portion of both artifacts is missing.

Shouldered Biface

This single artifact was found in situ at 5.6 m (18.25 ft) below the surface. Associated with the point were two waste flakes and a large, unmodified sandstone rock. This point and the level where the heavy concentration of cultural material occurred are separated by a sand-laden clay layer. The only other evidence of occupation at this lower level is the occasional appearance of a waste flake. The specimen was recovered along the upstream margin of the site at a point where the channel bank was vertical. This evidence tended to confirm the *in situ* position of the artifact.

Other Lanceolates

A unique lanceolate form was found intact in the stream channel. The final lanceolate is a medium-sized point found in a slump midway along the site.

OTHER LITHIC ARTIFACTS

Drills

Three drill forms were recovered from the Montgomery Site. The haft suggests it was originally a Dalton point that went through several cycles of resharpening before arriving at its present form, whose blade is morphologically classified as a drill. The specimen is mapped as a Dalton point. This artifact was found in place at 4.0 m (13.2) below the present surface of the terrace. One of the other two specimens is a heavily reworked point of undetermined type; the other has an expanding haft with a convex base.

Scrapers

A total of seven scrapers and scraper fragments were recovered. Only a single specimen was found in place, this at a depth of 3.8 m (11.3 ft). Clustering is especially noteworthy in the case of this artifact category. Five distinct groups can be identified in Figure 21. A single cluster of three scrapers, recovered at the lower margin of the site, were closely associated in a small slump.

Adzes

Four complete adzes and several possible fragments were at various locations along cutbank at the Montgomery Site. Two intact examples were recovered in close association with scrapers 155.8 m (1500 ft) upstream from the lower boundary of the site. Three of the four complete adzes were recovered <u>in situ</u> at depths of 2.4 m (8 ft), 3.4 m (11 ft), and 3.6 m (11.9 ft).

Drilled Stones

Two sandstone cupstones were recovered out of context at the location.

Core Hammerstone

This category is represented by a single specimen found adjacent to the site in the stream channel.

CONCLUDING REMARKS

Several observations and possible interpretations concerning the distribution of artifacts at the site can be made. Final conclusions are not in order at this time because only through a more thorough investigation, such as controlled excavation, can conclusive interpretation be validated.

The major occupation zone at the site appears to be restricted to a relatively uniform layer 2.4 m (8 ft) deep. This zone tends to become more deeply buried below the present terrace surface from the upstream to the downstream limits of the site. This indicates an old surface with greater downstream gradient than the present surface exhibits. There may be a lower occupation level a short distance above fluvial gravels, 1.2 m (4 ft) below the lower limits of the more prolific occupation zone.

The Dalton and Graham Cave components at the site appear to be closely associated. Both point types have wide distribution and both occur with greatest frequency in the same location. The location of high frequency occurrence of both the Dalton and Graham Cave artifacts (and other tool categories as well) is a short distance below the axis of the meander. Three possible interpretations may account for this distributional characteristic. First, this specific location was the zone of high-intensity use during the period of occupation by those groups. Second, this particular location was utilized most frequently over a period of time. The third possibility is that the stream has eroded more deeply into the site at this location.

Tool clustering such as that noted with adzes, scrapers and drills may indicate functional zones within the site. Although direct association cannot be proven, these clusters are most frequent where the Dalton point is also most frequent. If the tool clusters and Dalton points are associated, a multi-functional site fitting Morse's description (1975: 136) of a base settlement is possible. This possibility is further enhanced by the large amount of debitage at the site.

Finally, point types (other than Dalton, Graham Cave and perhaps Agate Basin) where more than one artifact was recovered also tended to cluster. These clusters were restricted primarily to the upstream portion of the site. One might interpret these clusters as tool kits left by small hunting bands or individuals that made an occasional visit to the location. The spatial and chronological connections between several seemingly distinct and unrelated groups remain to be interpreted.

Excavations

by

James A. Donohue

Tables 2 through 4 present the distributions, by depth, of the debris recovered from each of the trenches. No listings are given for Bank Trenches 2 and 3, nor for the slit trench or the perpendicular trench in Field I, since none of these trenches yielded cultural materials in any quantity. Even given the large distance between the test units, there is a striking similarity in the vertical position of the artifacts in the profile. Further, there is great consistency between the distribution of the debitage recovered in the excavations, and the depths of artifacts found and recorded by Collins.

Debitage is distributed through 50 cm of the profile in BT-1, 45 cm in BT-1A, and 50 cm in BT-4. Furthermore, all three trenches have the highest density of debris between 4.40 and 4.60 m below datum.

This vertical distribution of cultural materials is interpreted as the result of natural soil processes. Johnson and Hansen (1974), in an article on the effects

TABLE 2

Distribution of Debitage by Type and Level
BT-1

Cm Below Vert. Datum	A	B	C	D	E	F	Total
415 - 520	0	1	1	0	0	1	3
420 - 425	0	1	0	1	0	2	4
425 - 430	0	0	0	2	0	1	3
430 - 435	0	0	3	6	6	1	16
435 - 440	0	0	4	3	12	2	21
440 - 445	2	2	7	4	15	3	33
445 - 450	2	10	26	12	38	5	93
450 - 455	1	12	30	11	55	10	119
455 - 460	1	3	8	4	27	0	43
460 - 465	0	1	2	5	5	0	13
Totals	6	30	81	48	158	25	348

Key:
A - Cortex
B - Primary
C - Secondary
D - Tertiary
E - Shatter
F - Fragments

TABLE 3

Distribution of Debitage by Type and Level
BT-1A

Cm Below Vert. Datum	A	B	C	D	E	F	Total
415 - 420	0	0	1	1	0	0	2
420 - 425	0	0	0	0	3	0	3
425 - 430	0	0	2	2	5	0	9
430 - 435	1	4	6	3	8	2	24
435 - 440	6	14	28	18	68	5	139
440 - 445	0	5	3	5	8	1	22
445 - 450	0	2	3	2	0	0	7
450 - 455	1	0	1	1	3	0	6
455 - 460	0	0	1	1	0	0	2
Totals	8	25	45	33	95	8	214

Key:
A - Cortex
B - Primary
C - Secondary
D - Tertiary
E - Shatter
F - Fragments

TABLE 4

Distribution of Debitage by Type and Depth

BT-4

Cm Below Vert. Datum	A	B	C	D	E	F	Total
410 - 415	0	0	1	0	1	1	3
415 - 420	0	0	1	0	1	0	2
420 - 425	0	0	2	0	0	0	2
425 - 430	0	0	1	1	0	0	2
430 - 435	0	0	7	7	2	0	16
435 - 440	0	0	8	9	6	4	27
440 - 445	0	1	14	8	14	3	40
445 - 450	0	1	17	29	17	5	69
450 - 455	0	0	25	37	56	0	118
455 - 465	0	0	6	8	2	0	16
Totals	0	2	82	99	99	13	295

Key:
A - Cortex
B - Primary
C - Secondary
D - Tertiary
E - Shatter
F - Fragment

of frost-heaving in soil, have noted that (given adequate soil moisture) frost-heaving occurs whenever soil temperatures drop below freezing. These investigators also indicate that frost-heaving will occur with greatest intensity in poorly drained silty soils. Further, the authors maintain that the effect of frost heaving is cumulative and that "the longer materials have been subjected to frost heaving the greater will be their vertical displacement" (Johnson and Hansen 1974: 96).

It is interesting to note that the conditions that Johnson and Hansen describe as optimal for frost-heaving are exactly the conditions one would expect to find on a low aggrading floodplain during the early Holocene. The composition of sediments in the profile at the site is given in terms of sand-, clay-, and silt-sized particles (Fig. 25). It is suggested that the presence of flakes above the densest concentration of debitage (Figs. 22-24) is attributable to the agency of frost action. The debitage is diffused through 25 centimeters of the profile above the densest cultural levels, with a rapid fall-off in debris below the densest cultural levels.

The agency of frost-heaving, however, cannot account for the distribution of debris below the densest cultural levels. A plot of the distribution of the debris in the BT-1A excavation (Fig. 24) demonstrates a grouping of lithic debris below the densest cultural level equal to that above it. There is also lithic debris located below the densest cultural levels at BT-1 and BT-4. In Wood and Johnson's (1978) synopsis of processes of pedoturbation they outline a variety of factors resulting in soil mixing. They name crayfish as one of the most effective soil churners. These

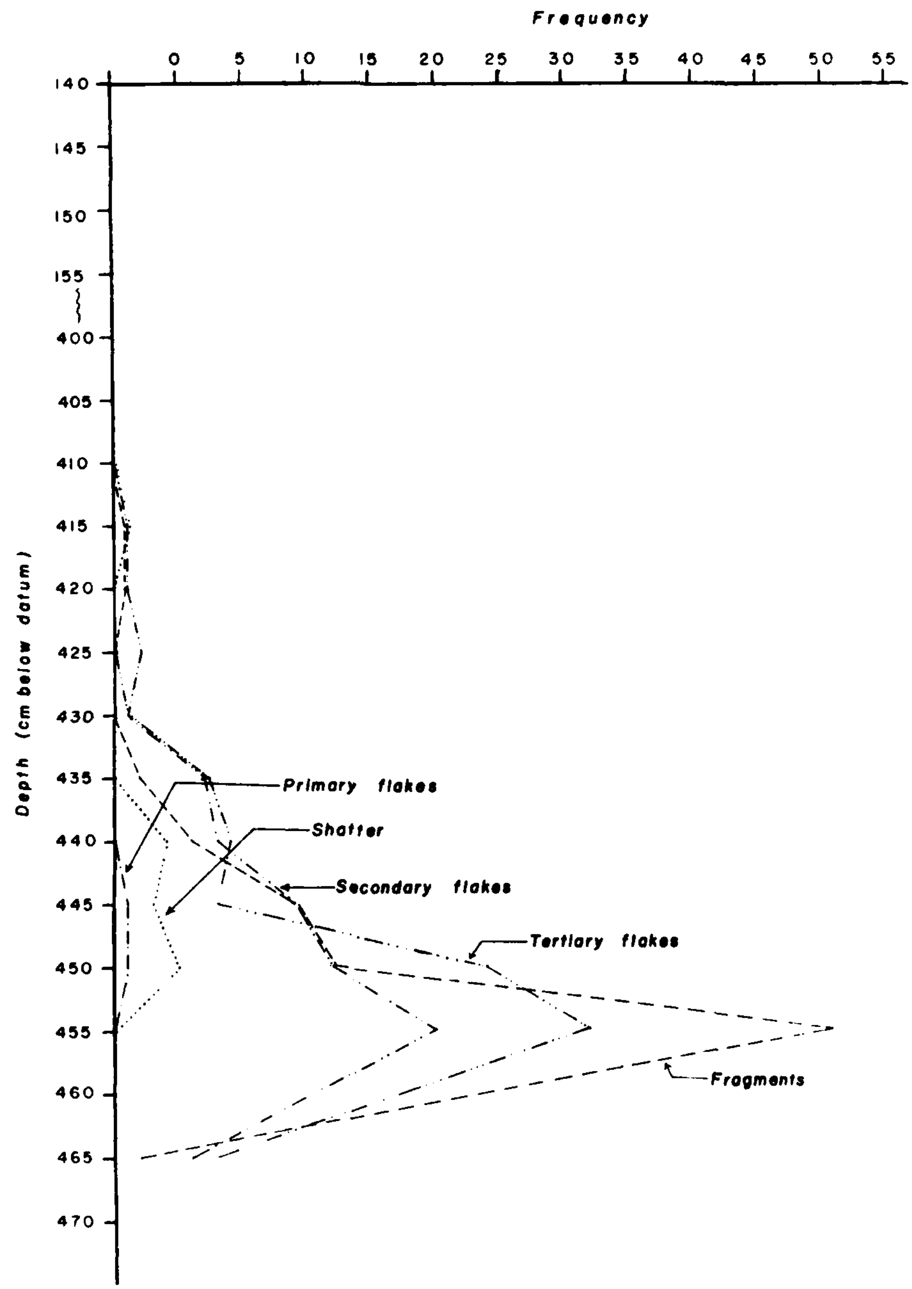


Figure 22. Frequency of debitage by type and depth, Bank Trench 4.

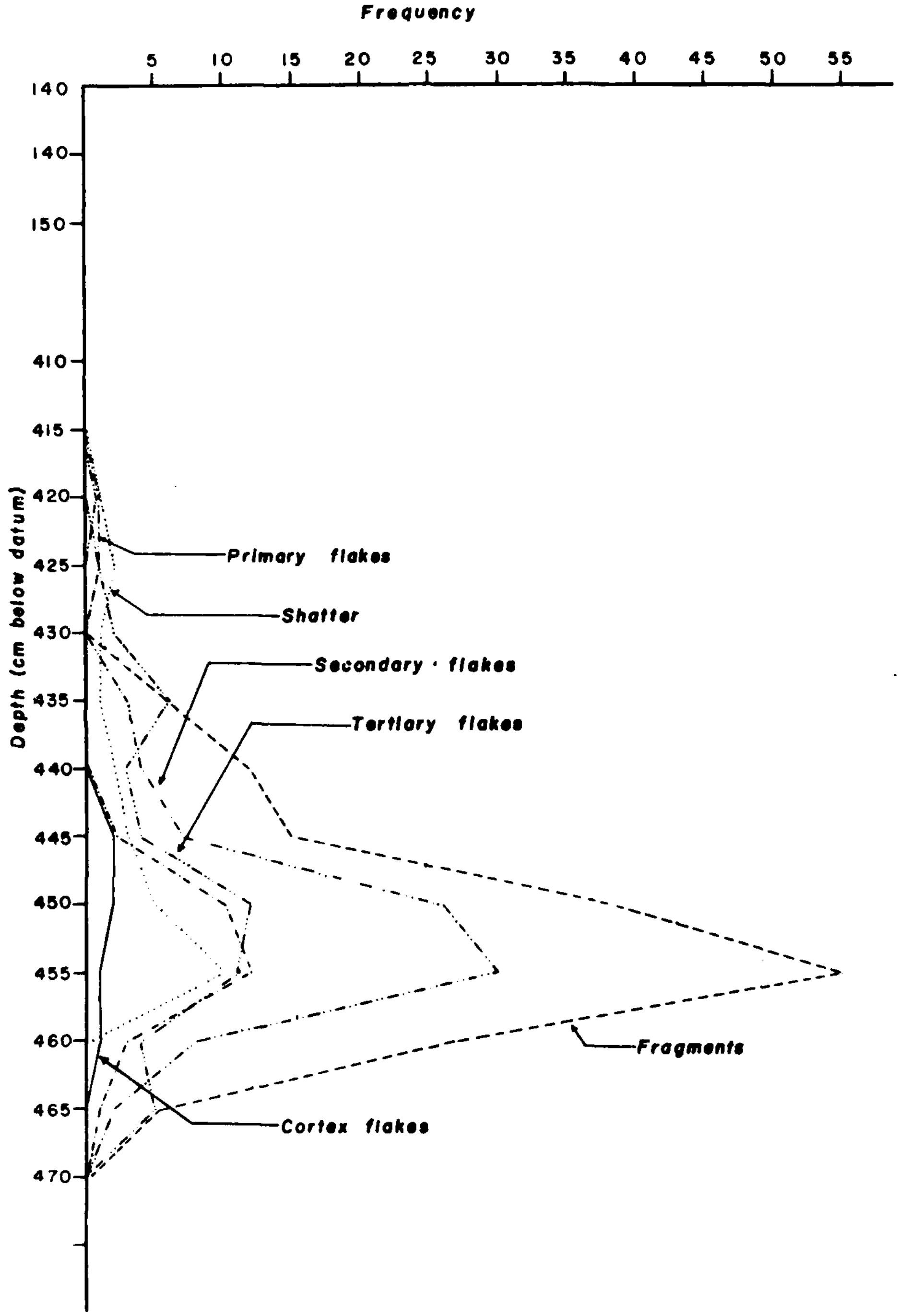
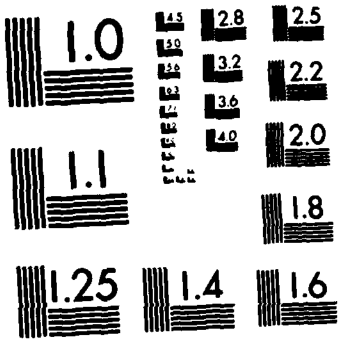


Figure 23. Frequency of debitage by type and depth, Bank Trench 1.

AD-A148 565 DOWNSTREAM STOCKTON STUDY; INVESTIGATIONS AT THE MONTGOMERY SITE 23CE261(U) MISSOURI UNIV-COLUMBIA AMERICAN ARCHAEOLOGY DIV C D COLLINS ET AL. 1983 2/2

UNCLASSIFIED DACW41-77-M-0241 F/G 5/6 NL

END
FILMED
DTIC



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

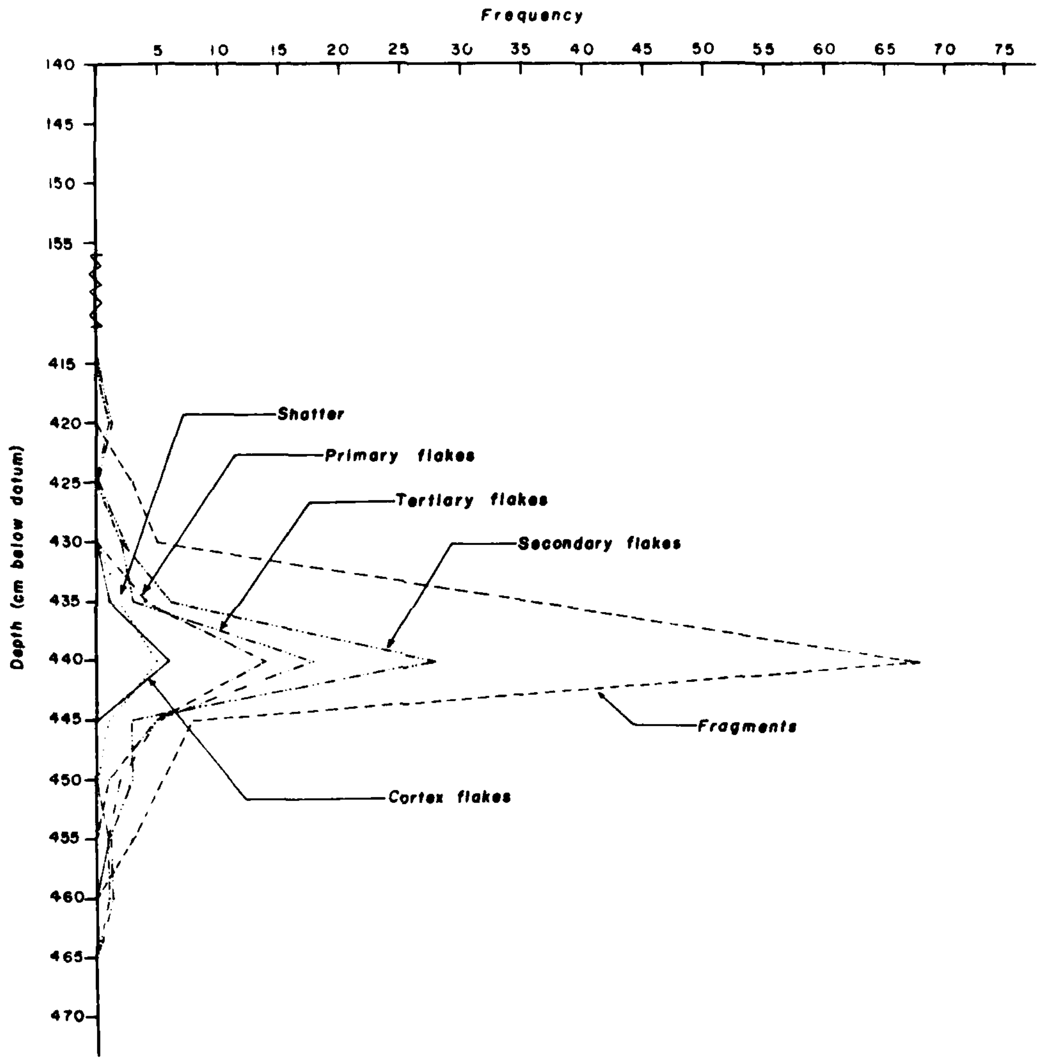


Figure 24. Frequency of debitage by type and depth Bank Trench 1A.

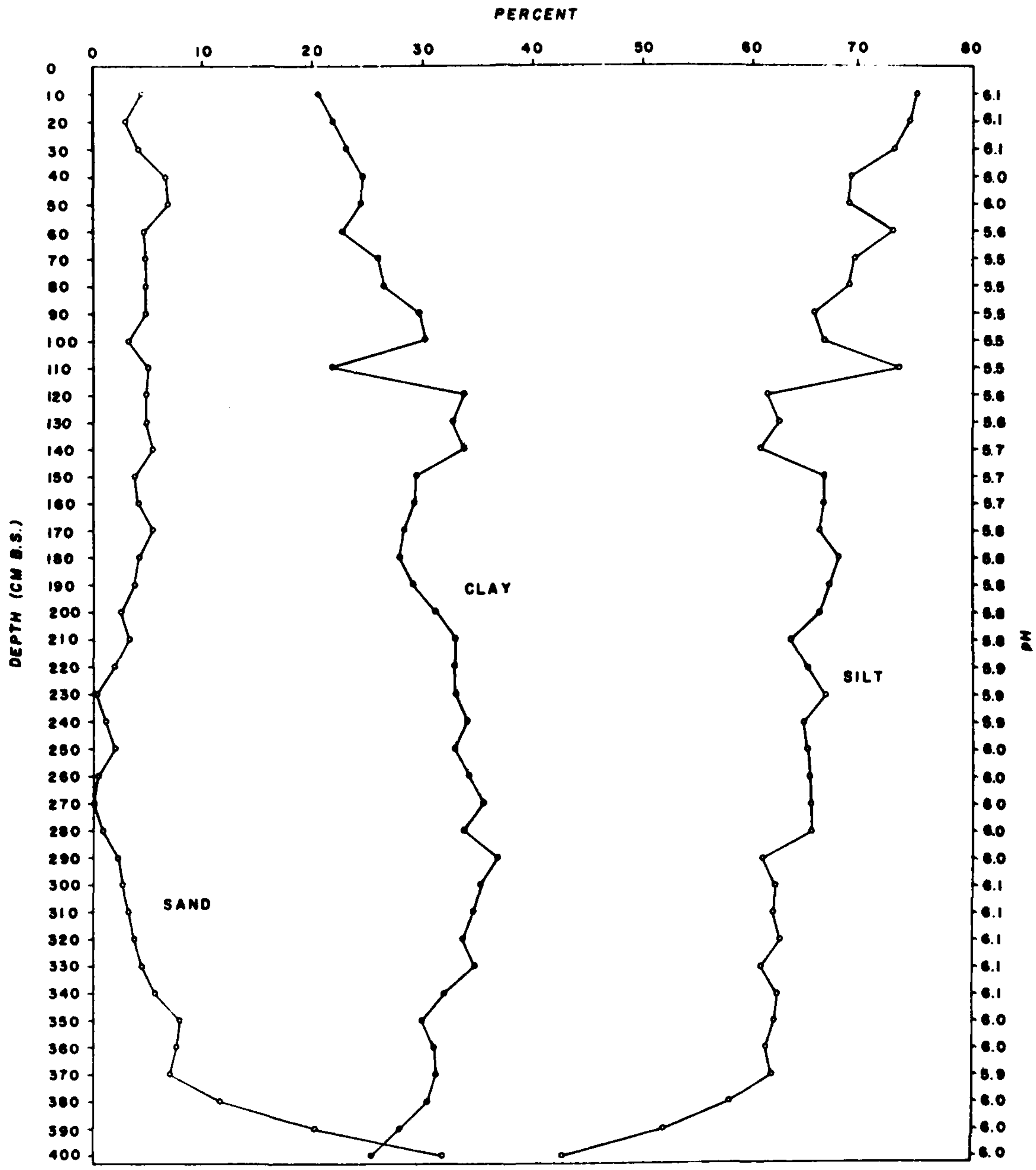


Figure 25. Plots of particle size and pH by depth.

authors note that a single crayfish chimney often contains more than a kilo of soil. It must be pointed out that numerous long, symmetrical, gray clay-filled krotovena were noted in every profile excavated at the Montgomery Site. These are interpreted as being a result of crayfish activities.

It is suggested here that the extreme distribution of small tertiary flakes and secondary flakes on either side of the maximum density levels of the site are a result of the burrowing activities of these small animals. Soil cracking during periods of drought would also contribute to the number of small flakes below the densest levels.

DISCUSSION

The distribution and composition of the lithic debris recovered from the Field 1 investigations clearly indicate the remains of a specialized, single behavior activity area. The remains from both BT-1 and BT-1A are interpreted as a single homogeneous collection resulting from primary manufacturing activities. This is indicated by the frequencies of primary flakes. Primary flakes make up 11.7% of the sample from BT-1A and 8.6% of the assemblage from BT-1. Furthermore, there are relatively low frequencies of tertiary flakes from both of these units, 13.8% for BT-1 and 15.4% for BT-1A. The very tight horizontal distribution and extreme homogeneity of the raw materials from these tests also argue for this interpretation. Negative evidence is the complete lack of any type of tools, burned earth, etc., which might indicate other kinds of behavior.

Another attempt at trace element analysis will be made to determine the possibility that all of this debris was struck from one core. Macroscopic examination certainly suggests that this could be the case.

In contrast to the BT-1 and BT-1A tests, more and varied kinds of activities are inferred from the types of debris recovered from BT-4. Two utilized flakes were recovered and there is greater variability in the chert types used as raw materials. 12.5% of the debitage from BT-4 is of blue-gray Chouteau Formation chert; the otner 87.5% is of white Burlington Formation chert. In addition to the tools and greater chert variability, there were pieces of burned earth and fire cracked rock associated with the densest distribution of debitage. It is significant to note that no cortex flakes are present and that less than 1% of the BT-4 assemblage are primary flakes, while 33.5% of the flakes are classed as tertiary. These contrasting frequencies of flakes types indicate that a different phase of tool manufacture or use is indicated for the BT-4 assemblage as compared to the BT-1 and BT-1A assemblages. It is suggested here that the BT-4 assemblage represents bifacial retouch and tool resharpening.

The horizontal distribution of the debitage from BT-4 tends to suggest that our excavation encountered only the southern edge of this activity area (Fig. 26). The horizontal distribution of flake types throughout the 50 centimeters of vertical profile shows a tight clustering when plotted as one level. This clustering may therefore support the hypothesis that the vertical distribution of materials is a result of frost-heaving and other forms of pedoturbation which may produce much

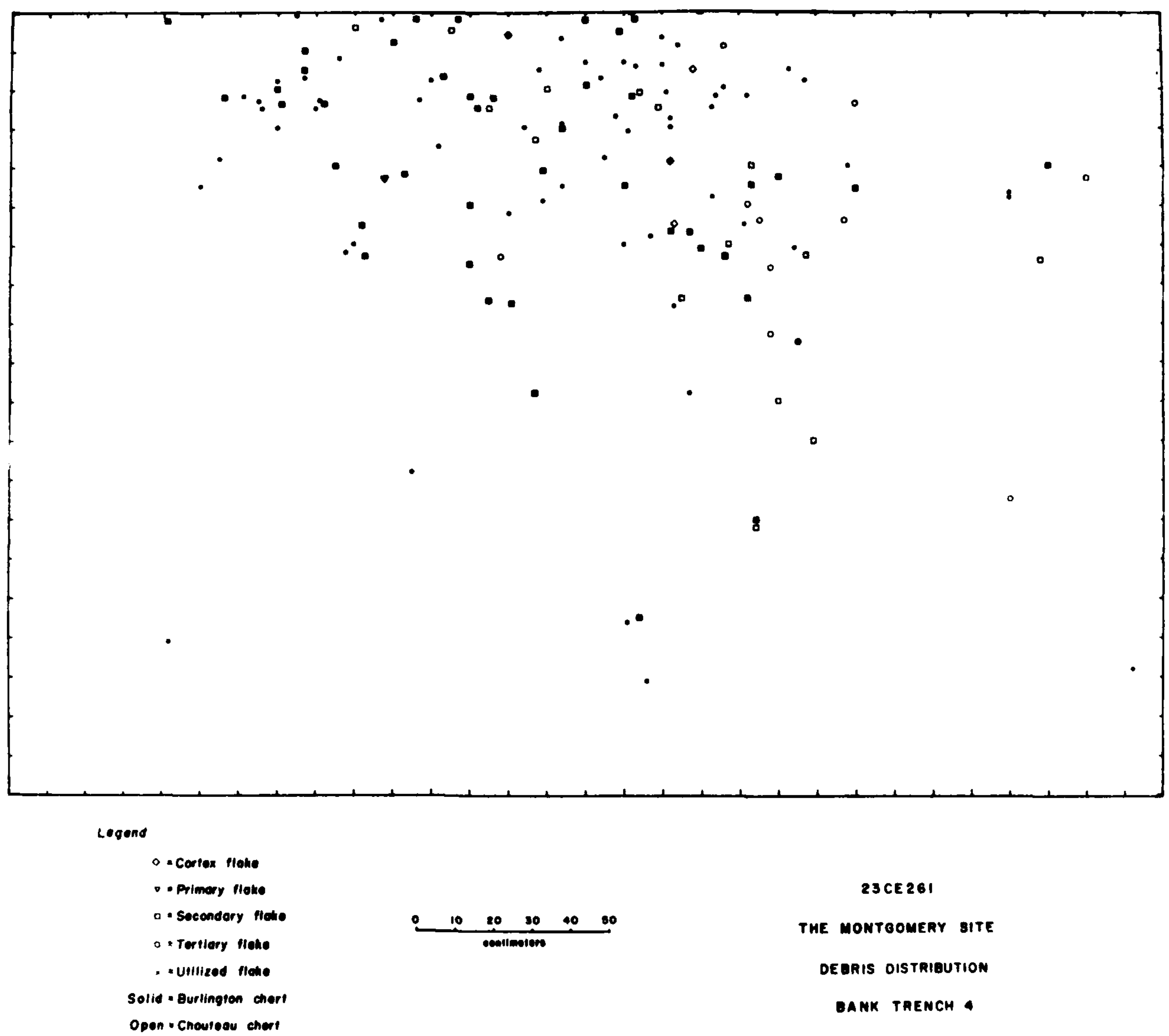


Figure 26. Horizontal distribution of lithic debris by type and raw material from all levels from the BT-4 excavation.

vertical (but little lateral) displacement of materials in the soil, thereby preserving a portion of the patterned remains of past human behavior.

CONCLUSIONS

by

James A. Donohue

The Montgomery Site is interpreted as a series of discrete, but overlapping occupation units. To date, no other drainage in southwest Missouri has revealed a similar patterning of cultural remains. It seems probable that other such sites do exist, deeply buried in Holocene alluvial terraces. This interpretation is supported by the discovery of other deeply buried sites of comparable age along the Osage River (Piontkowski 1977).

These data clearly indicate that the ecotone along the western edge of the Ozark Plateau — as it intergrades with the Western Prairies — was utilized by Dalton age hunters. Earlier interpretations of the prehistory of the Western Prairie region (within which the Montgomery Site is located) indicated little or no use of this region during pre-Altithermal times (Chapman 1975: 99).

Paleo-Indian, Dalton, Early Archaic, and Middle Archaic projectile points are represented at the Montgomery Site locality. The largest number of diagnostic artifacts belong to the Dalton period; the second largest group are identified as Graham Cave. Various Plano and Plano-like points are represented in much fewer numbers.

With the information available to date it is not possible to interpret the nature of the Dalton occupation at the Montgomery Site. McMillan (1976: 223) indicates that the Dalton occupation of Rodgers Shelter is of an ephemeral nature. This may also be the case at the Montgomery Site; no midden stains were identified during survey and excavation. Furthermore, all cultural deposits located in situ during survey appeared to be quite small, rarely extending over 10 or 15 meters in lateral extent. These observations were made during survey on a rapidly eroding site, and it is impossible to determine if this distribution is indicative of the rest of the locality. Some tool types, such as adzes, suggest a more intensively occupied site. To determine the nature of the Dalton utilization of the Ozark Highland-Western Prairie ecotonal at the Montgomery Site will require large, full scale excavations. The data such excavations will provide may provide answers regarding the nature of Dalton man's relationship to, and utilization of, the Ozark border region. Furthermore, it may also yield evidence bearing on theoretical issues concerning the nature of the general Dalton subsistence-settlement systems currently debated in the literature and of regional interest (Morse 1973, 1977; Schiffer 1975; Price and Krakker 1975).

It was hoped that the excavations would yield diagnostic point types which could be stratigraphically correlated. As noted in the point descriptions, many of these types of points overlap temporally. It would be most helpful in understanding intrasite interrelationships to clarify their temporal placement in this area. Further, these data would be useful in explicating the differences or similarities in the utilization of these bottoms between different time periods, and by peoples of different cultural orientations. Unfortunately, no diagnostic materials were recovered in any of the tests; the probability that this kind of information exists is amply demonstrated by the Collins collection.

Information already collected from the site has significance for interpreting the prehistory of drainages of similar magnitude in southwest Missouri. The Montgomery Site dramatically points out the possibility that the lack of evidence to date of early components in other drainages may be because they are deeply buried. More detailed comparisons of both the natural and cultural histories of the Pomme de Terre and Sac rivers will undoubtedly be forthcoming.

It is difficult to evaluate the total extent of damage done to the site by power releases from the Stockton powerhouse. The activity areas uncovered by the BT-1 and BT-1A excavations are completely destroyed. These tests recovered only the western edge of the already destroyed activity areas in Field 1. Although these activity areas have been interpreted as specialized primary manufacturing stations, there is no way to determine if these activity areas were related to more multifunctional activity areas which may have once existed to the east of the tests. The determination that this particular set of activity areas has been destroyed is not to be interpreted as indicating that no further occupation units exist in Field 1. One artifact was recovered from the slit trench excavation some six meters inland from the bank edge, and there is every probability that there are other deeply buried occupation units in this field.

Two recommendations were originally made for the Montgomery Site:

1. The Montgomery Site be nominated to the National Register of Historic Places;

2. The site locality be protected from further damage either through bank stabilization or meander cutoff, or through full scale excavation.

On September 21, 1978, the site was placed on the National Register of Historic Places.

The construction of the dike and channel by Montgomery alleviates the urgency of the second recommendation. Periodic monitoring of the locale is, however, warranted to ensure the continuing stability of the river bank and thus of the site.

ADDENDUM — MARCH 1978

James A. Donohue

In the spring of 1977 Clark I. Montgomery, at his own initiative, undertook the task of cutting off the meander on which the site is located. He accomplished this by excavating an earlier river channel, and forcing the mainstream of the Sac River into this channel by construction of a dike upstream from the meander loop. As a result of his actions, 23CE261 is no longer located on the main stream of the river, but on an artificial oxbow lake. As a direct result of this cutoff, the Montgomery Site is not now being negatively affected by power generation at the Stockton powerhouse. The site area is now subject only to the forces of natural erosion.

I have personally visited the site area some 15-25 times since the University of Missouri excavations were conducted there. During these visits I have noted some changes which have occurred since the meander cutoff in 1977. The cutbank wall, which was always vertical when the bank was subject to daily flooding, has begun to assume a more rounded contour, though a vertical drop of 3-5 meters is still the rule. Also, the river gravels in the channel have almost entirely silted over to varying depths. These changes may be attributed to the natural processes of erosion common to the evolutionary stages of oxbow lakes. The end result will most probably be increasing stabilization of the bank walls, as the energy potential for mass earth movement is decreased due to the gradual rounding and reduction of cutbank slope. No new exposures of cultural remains have been located during my subsequent surveys in the site area.

Erosion rates before and after meander cutoff could easily be obtained by examination of E.R.T.S. (Earth Resources Technology Satellite) imagery. This satellite takes a multispectral scanner image of the same point on earth every 18 days and has done so for a number of years. Using photogrammetric techniques, one can determine, with a high degree of accuracy, the exact amount and relative rate of erosion which has occurred within a given period of time. This information is readily available and can be used to plot the meander movement through time, thus allowing specific comparisons to be made. Conventional aerial photography can also be used to monitor erosion rates. Use of these remotely sensed data is the most effective means known to the author to document changes in the river, and to evaluate quantitatively the total effect of power releases on the area in comparison to the effects of meander cutoff.

REFERENCES CITED

Ahler, Stanley A.

1973 Chemical Analysis of Deposits at Rodgers Shelter. Plains Anthropologist 18(60): 116-131.

Baker, Dewey A.

1962 Geology of the Stockton Quadrangle, Cedar County, Missouri. M.A. thesis, Department of Geology, University of Missouri-Columbia.

Bell, Robert E.

1958 Guide to the Identification of Certain American Indian Projectile Points. Special Bulletin 1. Oklahoma Anthropological Society, Norman.

1960 Guide to the Identification of Certain American Indian Projectile Points. Special Bulletin 2. Oklahoma Anthropological Society, Norman.

Cambron, James W.

1957 Some Early Projectile Point Types from the Tennessee Valley. Journal of Alabama Archaeology 3(2): 17-19.

Chapman, Carl H.

1975 The Archaeology of Missouri, I. Columbia: University of Missouri Press.

Coe, Joffre L.

1964 The Formative Cultures of the Carolina Piedmont. Transactions of the American Philosophical Society, N.S., 54(5).

Crabtree, Donald
1972 An Introduction to Flintworking. _Occasional Papers of the Idaho State University Museum_ No. 28.

Crane, H. R. and James B. Griffin
1968 University of Michigan Radiocarbon Dates XII. _Radiocarbon_ 10(1): 61-114.

Donohue, James A., Andris A. Danielsons, and Michael V. Miller
1977 Test Excavations at 23CE261. Appendix D to the Downstream Stockton Study: The Cultural Resources Survey. Report to the U.S. Army Corps of Engineers. Pp. 124-129.

Eidt, Robert C. and William I. Woods
1974 _Abandoned Settlement Analysis: Theory and Practice_. Field Test Associates, Shorewood, Wisconsin.

Goodyear, Albert C.
1974 The Brand Site: A Techno-Functional Study of a Dalton Site in Northeast Arkansas. Arkansas Archaeological Survey _Research Series_ 7. Fayetteville.

Haynes, C. Vance
1976 Late Quaternary Geology in the Lower Pomme de Terre River Valley. IN: _Prehistoric Man and His Environments: A Case Study in the Ozark Highland_. Ed. W. Raymond Wood and R. Bruce McMillan. New York: Academic Press. Pp. 47-61.

1976 Personal communication.

Henry, Don O., C. Vance Haynes, and Bruce Bradley
1976 Quantitative Variations in Flaked Stone Debitage. Plains Anthropologist 21(71): 57-61.

House, John H.
1975 A Functional Typology for Cache Project Surface Collections. The Cache River Archeological Project: An Experiment in Contract Archaeology. Assembled by Michael B. Schiffer and John H. House. Arkansas Archeological Survey Research Series 8. Pp. 55-74.

Johnson, Donald Lee and Kenneth L. Hansen
1974 The Effects of Frost-Heaving on Objects in Soils. Plains Anthropologist 19(64): 81-98.

Leopold, Luna B., M. Gordon Wolman, and John P. Miller
1964 Fluvial Processes in Geomorphology. San Francisco: W. H. Freeman.

Luchterhand, Kubet
1970 Early Archaic Projectile Points and Hunting Patterns in the Lower Illinois Valley. Illinois State Museum, Reports of Investigations 19. Research Papers 3, Illinois Valley Archaeological Program, Springfield.

McMillan, R. Bruce
1971 Biophysical Change and Cultural Adaptation at Rodgers Shelter, Missouri. Unpublished Ph.D. Dissertation. Boulder: University of Colorado.

1976 The Dynamics of Cultural and Environmental Change at Rodgers Shelter, Missouri. IN: Prehistoric Man and His Environments: A Case Study in the Ozark Highland. Ed. W.

Raymond Wood and R. Bruce McMillan. New York: Academic Press. Pp. 235-245.

Morse, Dan F.

1973 Dalton Culture in Northeast Arkansas. Florida Anthropologist 26(1): 23-38.

1975 Reply to Schiffer. IN: The Cache River Archeological Project. Assembled by Michael B. Schiffer and John H. House. Arkansas Archeological Survey Research Series 8. P.p. 113-120.

1977 Dalton Settlement Systems: Reply to Schiffer (2). Plains Anthropologist 22(76) Pt. I: pp. 149-158.

Pangborn, Rolland E.

1976 Personal communication.

Perino, Gregory

1968 Guide to the Identification of Certain American Indian Projectile Points. Special Bulletin 3, Oklahoma Anthropological Society, Norman.

1971 Guide to the Identification of Certain American Indian Projectile Points. Special Bulletin 4, Oklahoma Anthropological Society, Norman.

Piontkowski, Michael

1977 Preliminary Archeological Investigations at Two Early Archaic Sites: The Wolf Creek and Hand Sites. Cultural Resources Survey, Harry S. Truman Dam and Reservoir Project, Vol. IX: Preliminary Studies of Early and Middle Archaic Components. Report to the U.S. Army Corps of Engineers, Pp. 1-57.

Price, James E. and James J. Krakker
1975 Dalton Occupation of the Ozark Border. Museum Briefs 20. Museum of Anthropology, University of Missouri-Columbia.

Roper, Donna C.
1975 The Truman Reservoir Survey: Approach and Preliminary Results. Paper presented at the 33rd Plains Conference, Lincoln, Nebraska.

1976 Cultural Resources Survey, Harry S. Truman Dam and Reservoir Project: Part II: The Archaeological Survey. Report to the U.S. Army Corps of Engineers. Division of American Archaeology. University of Missouri-Columbia. Pp. 8-40.

1977 The Downstream Stockton Study: The Cultural Resources Survey. Report to the U.S. Army Corps of Engineers, Kansas City District. American Archaeology Division, University of Missouri-Columbia. Pp. 1-143.

Roper, Donna C. and W. Raymond Wood
1975 Research Design for the Cultural Resources Survey, Harry S. Truman Dam and Reservoir Project: The Archaeological Survey. American Archaeology Division, University of Missouri-Columbia.

Schiffer, Michael B.
1975 Some Further Comments on the Dalton Settlement Pattern Hypothesis. IN: The Cache River Archeological Project. Assembled by Michael B. Schiffer and John H. House. Arkansas Archeological Survey Research Series 8: 103-112.

Scrivner, C. L., J. C. Baker, and B. J. Miller
1966 Soils of Missouri: A Guide to Their Identification and Interpretation. University of Missouri Extension Division.

Sjöberg, Alf
1976 Personal communication.

Watson, E. B. and H. F. Williams
1911 Soil Survey of Cedar County, Missouri. U.S. Department of Agriculture. Washington, D.C.: Government Printing Office.

Wood, W. Raymond
1957 Five Projectile Points from Western Missouri. Missouri Archaeological Society Newsletter 116: 10-11.

Wood, W. Raymond and Donald L. Johnson
1978 A Survey of Disturbance Processes in Archaeological Site Formation. Advances in Archaeological Method and Theory, Vol. I. Ed. Michael B. Schiffer. New York: Academic Press. Pp. 315-381.

Wormington, H. M.
1957 Ancient Man in North America. Denver Museum of Natural History Popular Series 4, 4th Edition.

UNITED STATES GOVERNMENT

memorandum

DATE: January 17, 1978

SUBJECT: Review of a draft report entitled "The Downstream Stockton Study: Investigations at the Montgomery Site, 23CE261" by Collins, et al, for the Kansas City District Corps of Engineers.

TO: Supervisory Archeologist (Hoffman) JJH

Basically, I liked this report. It is an interesting concept to have amateurs writing portions of this report, amateurs who have been observing the effects of inundation on this site every week for the past five years. They did not do a bad job in the write-up, and appear to have been very conscientious.

I would like to see a comprehensive site map showing datum, field numbers, location of Sac River and all excavation pits.

The photographs in this report are terrible. Perhaps this will be rectified in the final report, but the present photographs are useless for observing such things as cultural materials eroding out of the bank, high water marks, and details of artifact appearance.

On page 22 a reference is made to Appendix A by Donald Lee Johnson for a description of the soil profile. This appendix is not located at the back of the report. As it stands, not enough information is given on the soils and geomorphology of the site, and the soil profile (Figure 10) is not explicated adequately. In addition, descriptions of lithic materials such as Burlington chert are needed.

The culture history of the site and the region are not clear to me at all. Perhpas this is a function of the confusingly wide variety of diagnostic artifacts, most of which date to the early Archaic. The authors of the report seem to be unable to sort things out well enough to propose any definitive date(s) or sequences for the occupation. Perhaps this will be resolved in the future by more extensive excavation, which seems to be called for by the depth and extent of the site. Anyway, a description of the Dalton period is needed. Some reference is made to other reports which include this information, but it is my feeling that each of these University of Missouri reports should be able to stand by itself in terms of completeness of information. Along the same lines, page 78 says "The Dalton and Graham Cave components at the site appear to be closely associated." Are they saying that the Dalton and Graham Cave point types represent separate occupations? This is not clear to me.

Also on page 78 is a discussion of artifact associations and clustering. This discussion is purely speculative with no statistical support. It would have been easy to run a chi-square for verification of significant artifact associations, and other tests might reveal whether or not the observed clustering was real.

Page 79, Table 3 should read "Centimeters below datum" rather than "meters below datum."

Page 93 - both sides of the page are labelled "page 93" and the page has been put in backwards.

UNITED STATES GOVERNMENT
memorandum

DATE: February 10, 1978

SUBJECT: Review of draft report of "The Downstream Stockton Study, Investigations at the Montgomery Site, 23CE261" by C.D. Collins, A.A. Danielsons, and J. A. Donohue. Purchase Order No. DACW41-77-M0241.

TO: Supervisory Archeologist (Hoffman) JAH

I have no major criticisms about this report. It is thorough and well-written. The only thing I did not like was the very poor quality of photographs. They were next to useless in trying to get any information from them. The figures on pages 70-72 are very good, but too small. It is impossible to determine the symbols along the river. These figures need to be enlarged so they are legible. Also, where is Appendix A referenced on page 22?

As a whole, this report seems to be satisfactory.

REPLY TO REVIEWERS' COMMENTS

The only comments received were those from two HCRS-IAS reviewers. Basically, the IAS reviewers like the report and had no major criticisms. However, a few specific comments should be answered.

1. Both reviewers commented on the photographs. Those in the draft were Xerox copies of some rather poor photos. Subsequent to submission of the draft, the photographs for the final draft were prepared. All artifacts selected for photography were coated with ammonium chloride and individually photographed and printed at actual size. Plates in the final draft were assembled from these photographs and are reproduced as half-tones. Similarly, the other photographs were xeroxed in the draft and are properly reproduced in the final copy.

2. We agree that the reproduction of the map in Figure 21, even with the larger scale reproductions in Figure 21b and c, resulted in an unacceptable loss of detail. Figure 21 is accorded less of a reduction in the final draft and should retain the clarity of the original. Figures 21b and c have been deleted.

3. One reviewer wanted to see "a comprehensive site map, showing datum, field numbers, location of the Sac River and all excavation pits." Such a map was not required by the Scope of Work. The aerial photograph (Fig. 5) and the contour map (Fig. 8, here reproduced as a larger scale fold-out than in the draft) do illustrate the river and the excavation units.

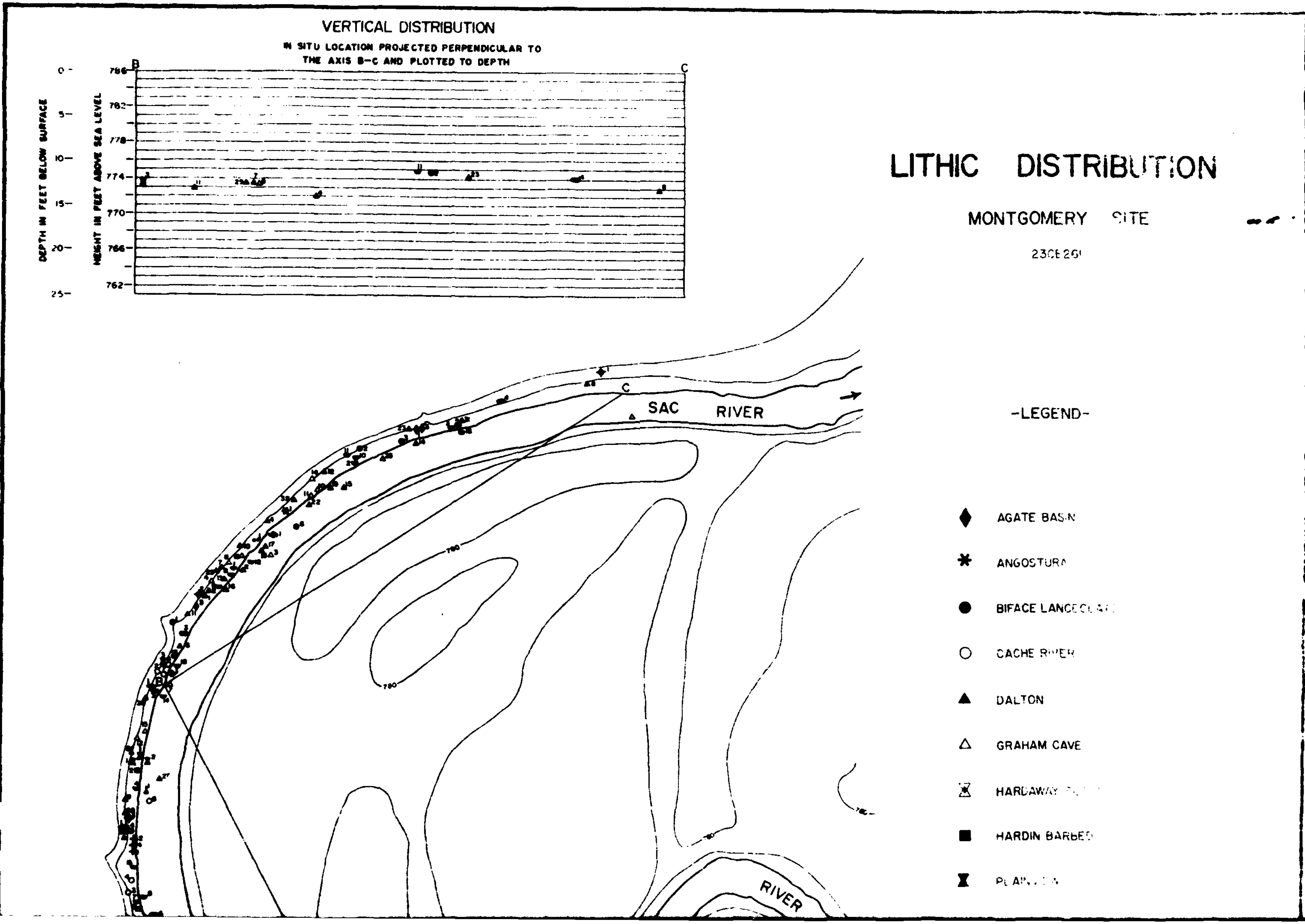
4. Appendix A, other than the soil profile (Fig. 10) and particle size and pH data (graphed in Fig. 25), was never received.

5. One reviewer pointed out typographical and binding errors that have been corrected.

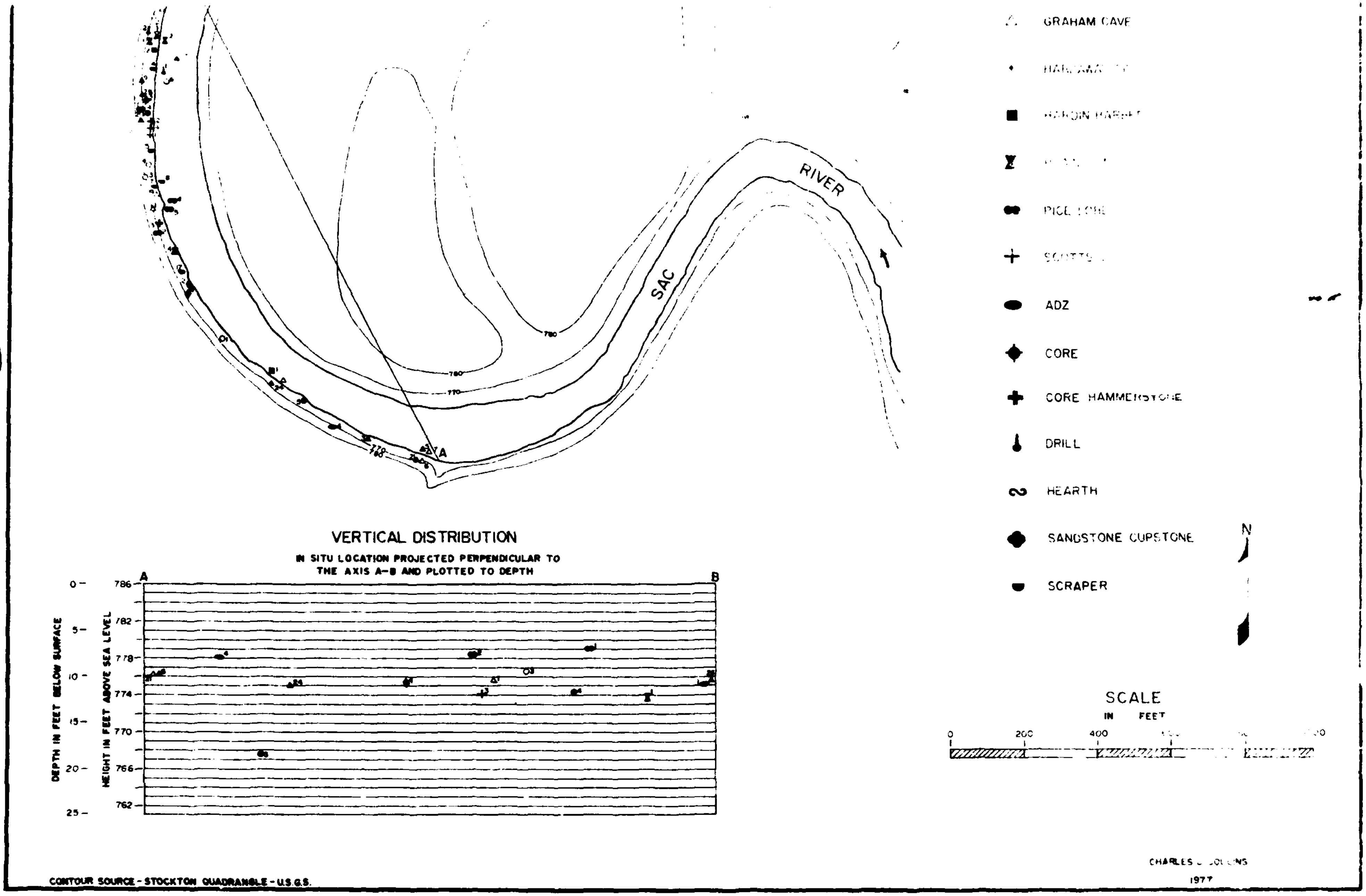
6. One reviewer commented that the authors of the report seemed unable to propose any definitive dates or sequences for the occupation. Indeed. It should be pointed out that parts of only two occupation areas (BT-1 and BT-4) were recovered in place: virtually all other material described in this report was collected either from slumpage or as it protruded from the face of the river bank. Assignment of age to the site was via typological comparison. Few of these types are securely dated anywhere, and specifically are poorly dated, if dated at all, in Missouri. The scourge of southwest Missouri archaeology – poor preservation of organic materials – deprived us of the ability to collect radiometrically datable samples from the cultural horizon. The single datable sample that we were able to procure – reported on page 28 – is associated with geomorphic rather than cultural events.

As for sequence, it should be reinforced that virtually all known cultural deposits at the Montgomery Site occur at virtually the same depth, give or take far less than a meter. The explanation for this is frankly puzzling. Dalton occupations at Rodgers Shelter, for example, are vertically interspersed throughout several meters of alluvium. Analysis at that site suggested a relatively rapid aggradation rate during the time of Dalton occupation. The Montgomery Site deposits are in a geologically equivalent sediment but occur in a vertically far more restricted zone, yet are typologically far more diverse. Available soils data do not suggest presence of a paleosol or other indication of a period of stability. Perhaps future investigations will clarify the nature of the sediments and of the occupation, but until that time any speculations would be totally premature. Such future investigations should definitely be multidisciplinary in nature and include intensive work by a geomorphologist.

7. One reviewer commented that the discussion on page 78 is speculative. That is correct. It was acknowledged to be such in the final paragraph on page 77.



VERTICAL DISTRIBUTION
IN SITU LOCATION PROJECTED PERPENDICULAR TO THE AXIS B–C AND PLOTTED TO DEPTH
DEPTH IN FEET BELOW SURFACE
HEIGHT IN FEET ABOVE SEA LEVEL
LITHIC DISTRIBUTION
MONTGOMERY SITE
23CE261
SAC RIVER
RIVER
-LEGEND-
AGATE BASIN
ANGOSTURA
BIFACE LANCE
CACHE RIVER
DALTON
GRAHAM CAVE
HARDAWAY
HARDIN BARBED


GRAHAM CAVE
PICE CORE
ADZ
CORE
CORE HAMMERSTONE
DRILL
HEARTH
SANDSTONE CUPSTONE
SCRAPER
SAC
RIVER
780
770
A
B
N
VERTICAL DISTRIBUTION
IN SITU LOCATION PROJECTED PERPENDICULAR TO THE AXIS A–B AND PLOTTED TO DEPTH
DEPTH IN FEET BELOW SURFACE
HEIGHT IN FEET ABOVE SEA LEVEL
0
5
10
15
20
25
786
782
778
774
770
766
762
SCALE
IN FEET
0
200
400
CONTOUR SOURCE - STOCKTON QUADRANGLE - U.S.G.S.
1977

END

FILMED

1-85

DTIC